

# Sub-Zero Warms Up to Flexible Fabrication

A combination laser-punch work center and servo-electric panel bender automate sheetmetal fabricating at this appliance manufacturer, conserving labor, reducing scrap and boosting the bottom line.

The 480,000-sq.-ft. Sub-Zero, Inc. appliance-manufacturing facility in Goodyear, AZ, opened in mid-2011 to accommodate the company's growing production demands that had outstripped its two manufacturing plants in Fitchburg, WI. The new plant, with 300 employees working two shifts, houses an array of sheetmetal-fabrication equipment including stand-alone turret punch presses, laser-cutting machines, a servo-electric automated panel bender and a punch/shear combination machine.

Among the products churned out by the plant are its groundbreaking built-in refrigerators, developed some 60 years ago, as well as a full array of domestic cooking appliances including kitchen stoves, cooktops, wall ovens, warming drawers and ventilation equipment.

## Punch-Shear Flexibility

Sheetmetal fabrication took a productivity turn for the best when, according to manufacturing engineering technician John Dolinski, Sub-Zero purchased its automated punch-shear combination machine in 2008 (a Shear Genius from Finn Power, now Prima Power North America).

"We were having issues with our existing stand-alone fabricating equipment, and began searching for new technology," explains Dolinski.

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. Sorting and stacking automation then moves the parts to secondary bending operations without being touched by human hands. As loading, punching and shearing of parts became automated at Sub-Zero, the result was finished parts with a dramatic reduction in scrap and manual labor, while increasing profitability.

Sub-Zero also finds that the machine eliminates wasteful skeletons and costly secondary operations such as deburring. And the integrated right-angle shear avoids the nibbled edges on the part exteriors. In fact, the same clamps that hold the sheets for punching also hold them for shearing. The end result is true single-piece flow syn-



*Sub-Zero manufactures modern kitchen appliances using state-of-the-art sheetmetal-fabrication equipment.*

chronized with Sub-Zero's cycle times.

"The punch-shear combination machine operates much more quickly and accurately than what we were using before," says Dolinski. "Automation is what really takes fabrication to a new level. The machine also processes longer parts much more efficiently than our old stand-alone turret punch presses."

"We try to run lights-out on a daily basis," adds supervisor Howard Masters. "With the Shear Genius, we no longer need to shear blanks to size. We can nest multiple parts on one sheet, and have eliminated a great deal of material handling."

## Servo-Electric Bender

Following the 2008 addition of its punch-shear combo, in 2009 Sub-Zero



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acquired a servo-electric panel bender (the Prima Power EBe Express Bender). Using the bender, production is completely automated, from the loading of flat, punched parts to the unloading of the finished product.

The machine has a maximum bending length of 100 in. and a maximum opening height of 8 in. Actuation of the bending blade (vertical and horizontal) is by NC servo motors, instead of hydraulic cylinders. Upper-tool movement also is driven by an NC servo motor.

“The EBe has been a very dependable machine,” says Dolinski. “It just runs and runs. One of our jobs used to require three separate press-brake operations to produce 80 to 100 parts in an 8-hr. shift. With the EBe, we complete the job in just 90 min.”

Describing additional benefits of the panel bender, Dolinski explains that while the EBe is used primarily on galvanized parts, it will soon begin to form stainless-steel panels. “On these large stainless panels, we often require two different press-brake operations,” says Dolinski. “With the tool change in between operations, it takes an operator as long as 4 hr. to run the parts.

We can fabricate the same part in about 1 min. on the panel bender, and setup time is next to nothing. And we also can emboss the panels on the bend line.”

### **One Happy Plant Manager**

Sub-Zero plant manager Ron Jones sums up the benefits of the company’s recent capital-equipment purchases:

“The punch-shear combo and servo-electric panel bender have allowed Sub-Zero to improve sheet-metal performance in many ways,” says Jones. “Large parts requiring multiple tooling changeovers for forming have been moved to the panel bender, and are improving productivity by approximately 800 percent, while also improving the ergonomics of forming large parts on traditional press-brake tooling.

“Meanwhile, the punch-shear combination machine provides significant improvements in cutting, punching and palletizing,” Jones continues, “work that previously required multiple routings and operations. Overall, our once-complex machine routings and programs have evolved into simple operations that provide significant improvements for running multiple products and operations. As a result, we’ve improved our speed, accuracy and flexibility.”

What plant manager wouldn’t want to be able to say that? **MF**

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