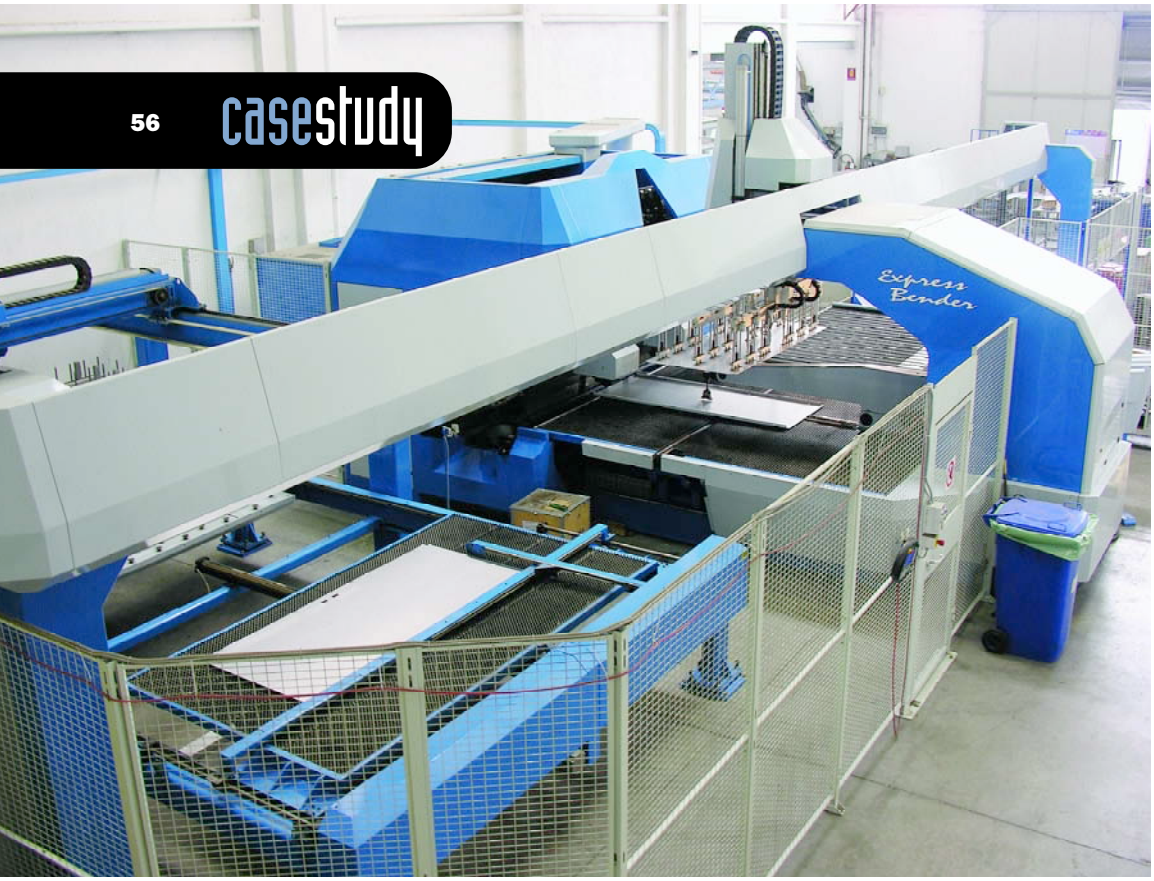


Ilinox's Express Bender panel bending machine, which features automated load and unload of sheet metal blanks, is fed by its large Night Train storage system.

Euros zoned in on competing

A tale of a fabricator, a contract manufacturer, and a commercial refrigerator-maker

By Dan Davis,
Executive Editor

A strong independent streak exists in the American psyche. It helped forge an industrialized nation out of the wilderness and establish a democratic society envied by many in the world.

But with an independent mindset comes a stubborn streak. When a country has so many natural resources, talented citizens, and open space, it doesn't worry too much about what the rest of the world is thinking.

That's changing, however. Technology has brought the world closer together, and international trade policies are making everyone a stakeholder in the global economy. The challenges that European metal fabricators face aren't too different from those North American fabricators face. In fact, these European fabricators have had to come to grips with low-cost competitors and international trade issues much earlier than their North American counterparts.

Independent thought and actions are still valuable, but inspiration from outside sources—in this case European companies—can provide important lessons. Visits to an Italian stainless steel cabinet fabricator, a Finnish electronics contract manufacturer, and a multinational commercial refrigerator-maker—sponsored by metal fabricating equipment manufacturer Finn-Power Inc.—show that metal fabricating doesn't have to disappear in Western societies as emerging economies become more adept at manufacturing.

Stainless Steel Wonder

Nestled away in an industrial park in Parma, Italy, behind a stainless steel fence is Ilinox S.r.l. The choice of stainless steel as the fence material is noteworthy because the company's success is linked inextricably to the metal. Ilinox manufactures stainless steel cabinets for electrical and medical markets and tanks for food and pharmaceutical processing industries.

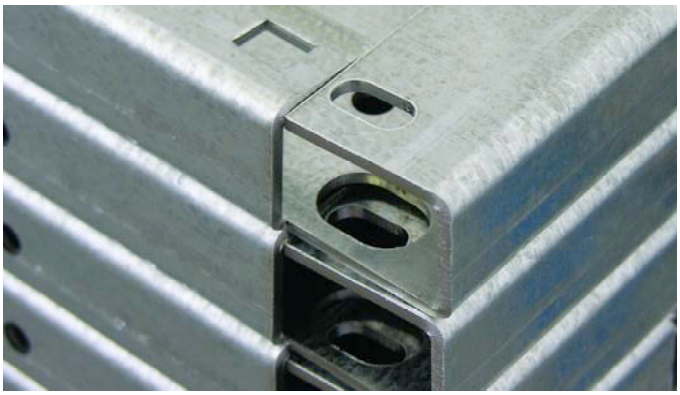
The cabinets represent a majority of its business. Even though a large number of the cabinets are standard shapes and sizes—and can even be ordered from a catalog—Ilinox offers engineering support for customers needing tailored designs for specific applications. One recent example was an electrical cabinet fabricated from 2-millimeter (0.08-inch) stainless steel that contained track controls for a new high-speed railway being built near the Ilinox facility. The cabinets had to be especially sturdy because they would be only a whisker away from trains blazing down the track.

Claudio Allodi, Ilinox's managing director, said that in 2003 his company began to explore new laser cutting equipment and material handling automation that could connect the laser to a panel bender. The laser was a necessity because the laser produced a nice, burr-free edge that was just not possible with a shear. Also, the laser could handle certain cuts without the need for a tooling adjustment, which was always necessary with a turret-type device. The material handling made sense because Ilinox wanted to take labor cost out of the fabricating process. Load and unload options on some semiautomated laser cutting devices didn't make too much sense, according to Allodi, because an operator was still needed to set up raw material to feed the semiautomated device.

Early explorations revealed that integrating a panel bender with a laser cutting device, with each made by a different manufacturer, might prove problematic. In 2004 that concern led Ilinox to Finn-Power, which supplied an L+P laser/punch combination machine and an Express Bender panel bending machine, both connected to a Night Train flexible manufacturing system.

The laser/punch combination has given Ilinox the benefits of cutting with a 2.5-kilowatt laser, but the speed and functionality of a turret punch. The punch comes in handy for making holes, countersinks, and raised forms or indentations on the stainless steel sheet.

The panel bender can produce radial bends on Ilinox's stainless steel cabinet doors that otherwise might require a roll bender or some other forming tool.



▲ Ilinox's panel bender provides precise bends that are necessary for secondary welding processes.

The combination unit can accommodate sheets as large as 3 meters (9.840 feet) by 1 m (3.28 ft.) and requires only one operator and one programmer to run the device. Allodi said the unit runs specialized production during the first and second shift, but on the third shift it runs unmanned because it is pumping out high-volume, regularly scheduled components.

The Express Bender, which runs one shift per day, handles the awkward bends that would be difficult for one—or even two—press brake operators to handle. The laser-cut blanks are automatically delivered to the panel bender for bending and unloaded when complete. The unit can handle blanks as large as 2.5 m (8.20 ft.) by 1.5 m (4.92 ft.) and as heavy as 65 kilograms (143.30 lbs.).

The panel bender is versatile enough to handle a positive bend on one side of a blank and a negative bend on the other side of the blank without have to flip the blank. The machine also can hem steel edges with a special flat tool that comes down on top of a bend; Allodi said this comes in handy for fabricating doors without sharp edges. One full-time operator, who is involved in quality checks and preparing bent components for delivery to assembly, is dedicated to the panel bender.

About 30 seconds is all it takes an operator to change the bending program. Allodi said that before the Express Bender, every bend was made on press brakes.

At the heart of the sheet metal production area is the Night Train. Not only does it help feed the automated equipment, the flexible manufacturing system (FMS) also has proved to be a great storage solution. Ilinox is now able to manage its steel supply much better, and the FMS created a lot of space because it utilizes plenty of vertical storage.

The storage system has 300 cassettes, of which 60 percent is dedicated to raw material. A limited amount of cassettes is dedicated to work-in-process because of the low-volume, short-turnaround jobs. Some space actually is dedicated to scrap because the leftover stainless steel skeletons are valuable to metal dealers.

Ilinox still maintains a seasoned collection of craftsmen—welders, press brake operators, and metal finishers—among its 60 employees, but plenty of the labor costs have been removed from the metal cutting and bending operations. For those jobs that require more labor content, Ilinox has a sister company in a country with lower labor costs. That's in Hungary, however, not China.

Manufacturing Mix

Nokia is one of the largest mobile phone manufacturers in the world. One might figure that plenty of Finnish subcontractors do work for the mobile-phone giant. He or she would be right, but that doesn't mean that those fabricating shops are content being in Nokia's supply chain.

"We don't want to be a telephone-maker," said Mikko Leidén, director of InCap's Helsinki, Finland, location. "There are bigger companies than us that can do that."

InCap, an electronics contract manufacturer, has been around nearly 30 years and boasted revenues of $76.7 million in 2005. The company has multiple locations in Scandinavia and central Europe and is investigating starting operations in Asia.

The Helsinki operation has 60 employees in its 5,700-sq.-m (61,354-sq.-ft.) facility. It specializes in metal fabricating and assembly of products, ranging from components for weather balloons to laminations for power generators to video amusement devices. The company, overall, still does plenty of telecommunications business, but it has reached out aggressively to the health care, measurement, and process manufacturing equipment industries.

In Helsinki, InCap produces about 3.5 million different "units," which range in volume from 10 to 10,000, according to Leidén. The facility has 10 primary customers.

"Mass product—I don't think it's possible to do it in Finland anymore," Leidén said. "But when the product has a lot of variances and changes, you need to be close to the customer."

Speed is the name of the game at InCap, but not machine speed. It's the speed to get things up and running and switch between jobs. It keeps deliveries on time and helps the company be more responsive to engineering changes in products.

That was the main motivation behind the purchase of a Finn-Power LP6 laser/punch combination machine in 2005. As an example of how the equipment has made a difference, Leidén pointed to a 2-in. by 1-in. metal component that used to be

▲ The punching tools on Ilinox's laser/punch combination machine are put to good use creating openings in this cabinet component.

▲ Costan S.p.A. has a showroom for its commercial refrigeration and freezer products, but the company does not have a warehouse of product. Every unit is built specifically from the incoming order.

fabricated with 10 different tools on an older turret punch press. On the laser/punch machine, only four tools are needed for certain quick punch-outs, and a 2.5-kW laser handles the rest of the cut. The use of fewer tools decreases the likelihood that operators will have to make tooling changes in the equipment, he added.

In 2006 InCap invested in a Finn-Power SG6 punching/shearing cell with the Night Train FMS. This equipment will replace three older punching machines, one of which will be kept for prototype work and jobs involving specialty materials.

The SG6 will handle the cutting jobs that don't require the complex curved cuts that are possible on the laser. Meanwhile the laser can cut thicker material—up to 0.313 in.—than the SG6, which can cut up to 0.160 in.

Leidén said the programming of these newer metal fabricating devices makes it possible to get the most out of every cutting job. For instance, he described how the punching/shearing device can cut some very large generator laminations and simultaneously punch out smaller parts from the laminations' midsection, which normally just might end up in the scrap heap.

Once the Night Train is fully integrated with both the LP6 and the SG6, Leidén said he anticipates the equipment will run unattended during the weekend.

"The flexibility is the key," he said.

Hot Refrigeration Business

Costan S.p.A., Limana, Italy, produces 30,000 refrigeration and freezer units per year, mostly in the form of horizontal display cases. The products end up in supermarkets all over the world, from Austria to China.

This doesn't sound like it has much to do with the business of a metal fabricating shop that specializes in low-volume jobs, but Costan is not a typical high-volume manufacturer. It builds everything to order.

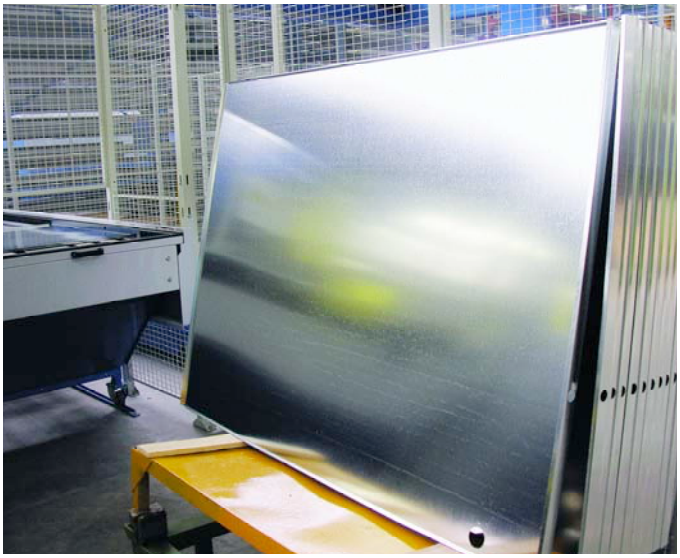
Such is the nature of the business. A refrigerator/freezer style can be selected from a catalog or a showroom, but every installation has its own unique design parameters. No two products are fabricated exactly alike.

More than 800 people work in the Limana factory, and more than 2,500 work in Costan facilities worldwide. The Limana factory, more than 45,000 sq. m (484,376 sq. ft.) in size, has a sheet metal department that works three shifts, while the assembly line works mostly two shifts.

Costan is no stranger to automation of its metal fabricating activities. The company purchased two Shear Genius punch/shear combination machines and a Night Train FMS from Finn-Power in 1999. The storage system has 200 storage cassettes for steel sheet and is 50 m (164.04 ft.) long. Two operators work the line during the first and second shift, and one person attends the system at night.

Giandomenico Pinotti, who is responsible for Costan's sheet metal production, said the line has worked well for them over the years, but it did not meet all of their needs. Business has grown in recent years, and the busy season, which used to be from

▲ Electronics contract manufacturer InCap installed this laser/punch combination machine in 2005 and a punching/shearing cell with an FMS for raw material and work-in-process this year. Plans call for integrating the equipment into one automated sheet metal fabricating line.



▲ The Express Bender panel bender can handle large steel blanks that might pose an awkward material handling dilemma if done on a press brake.

May to November, is now beginning sooner and sooner. Pinotti said the factory has been hopping since January, and it has remained that way even into the summer.

To help them with the fabricating activity, Costan has a new 60-m- (196.85-ft.) long Night Train with 250 cassette storage slots. It is connected to two new Shear Brilliance punch/shear combination machines and an Express Bender panel bender. In the storage system, 150 slots are dedicated to semi-punched or finished components and 100 slots to raw material.

Eight people work the new line over three shifts: two on the punch/shear equipment and one on the panel bender on the first and second shifts and one on the punch/shear equipment and one on the panel bender on the third shift. The older punching/shearing line calls for two operators on the first two shifts and only one on the third shift.

Costan's products need a lot of bends. Pinotti estimated that Costan produces at least 7,000 different components, most fabricated from 1-mm-thick (0.04-in.) sheet metal that need sto be bent in some way.

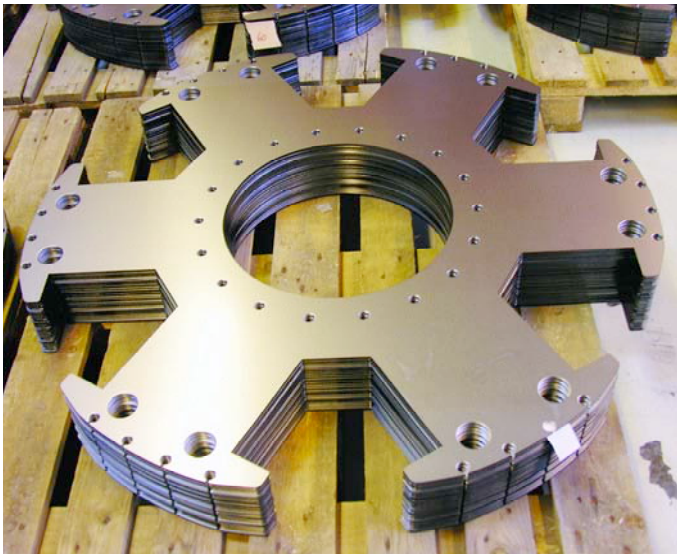
Pinotti added that all bending activity is done on a just-in-time basis. No storage of bent components is required.

The Express Bender fits that manufacturing approach because programs can be initiated in less than a minute. The panel bender also is adept at handling long sheets of aluminum, stainless, and cold-rolled steel sheet that might prove difficult for a press brake operator to bend.

Some of the older, stand-alone press brakes are being moved closer to the automated storage system and panel bender. The goal is to keep material handling to a minimum in the just-in-time environment, Pinotti said.

Despite the presence of four punch/shear machines, the Costan facility still keeps its five stand-alone punching machines. The volume is large enough to warrant running the older machines. To keep throughput high, each of the older punching machines has dedicated tooling and is used for the same type of jobs repeatedly. The low-volume, high-mix fabricating activity is left to the punch/shear combos attached to the Night Train.

Pinotti admitted that Costan was still in a learning curve with its newest punch/shear/bending line. He hoped to be able to eliminate an entire shift from the manual punching cell when the line is finally up and running seven days a week.



▲ These giant laminations for a power generator are an example of the diversified products that InCap fabricates for customers.

▲ Costan has two Night Train FMSs that, if placed next to each other, are longer than a football field.

Lessons Learned

What can North American metal fabricators take away from these three quick glimpses into European fabricating operations?

- To be competitive with the rest of the world, these companies have done what they can to minimize labor related to material movement and storage.
- These companies are involved in specialty markets that call for plenty of engineering input. The products they are manufacturing or the parts they are fabricating are constantly tweaked or redesigned. It pays to be responsive and, in many instances, close to customers—whether in-house or in-country.
- These companies bought equipment that solved a problem for them. Flexibility was a priority over speed or power.
- Your grandmother will never be able to make gnocchi like they do in Parma, Italy.

That's advice even independent thinkers will be hard-pressed to ignore.

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