

Metalforming Thrives

in Finland and Italy

Automation, with a capital "A," has several European sheetmetal-fabrication shops gracefully moving sheets through shearing, laser-cutting, punching and bending operations with minimal operator intervention, enhancing productivity and quality.

BY BRAD F. KUVIN, EDITOR

Since its battering during World War II, tiny Finland—a mere 130,500 sq. miles with a population of 5.1 million—has tightened its collective belt and made more than just an economic recovery. Finland ranks second in percentage of GDP spent on research and development; ranks as a world leader in literacy, mathematics and science; claims the highest per-capita use of mobile phones; and, according to the United Nations Development Report of 2001, was “the most technologically advanced country in the world.”

When you get to see Finland the way I did last September—with a bird’s-eye view of several state-of-the-art metalforming and fabricating plants—you quickly appreciate what this country has accomplished. Along with its obvious dedication to continuous education and learning—Finland scores the highest in all of Europe in enrollment in universities and technical colleges—you can’t help but appreciate its unrelenting investment in advanced and cutting-edge metalworking technology.

Thanks to the efforts of metalforming-equipment manufacturer Finn-Power, I, along with editors from other U.S. publications, toured several impressive shops throughout Finland, as well as Italy. Finn-Power operates its headquarters out of Kauhava, Finland, along with an R&D center and two assembly plants. It also operates two manufacturing plants in Alaharma, Finland, and a manufacturing and assembly plant in Vilppula, Finland. Its bending-automation division resides in Colonia Veneta, Italy, near Verona.



Finnish company Halton manufactures a variety of indoor-climate products—air-distribution units, fire dampers and commercial-kitchen ventilation products for example—some of which it fabricates from prepainted and galvanized sheetmetal.

First Stop: Climate-Control Specialists Halton Oy

In its two Finnish plants, Halton Oy has invested in a bevy of new sheetmetal punching machines, bending equipment and automation apparatus. The firm designs and builds heating, cooling and ventilation systems, air-flow-management products, air-diffusion products and fire dampers.

A plant in Kausala, Finland, specializes in indoor ventilation products, processing primarily galvanized steel 0.5 to 1.5 mm thick. It’s busy, running three shifts a day, seven days a week. Coil-fed cut-to-length lines process 3000 tons of steel per year to feed the 215,000-sq.-ft. plant.

One focus for the facility has been part consolidation to improve productivity. It invested, in March 2003, in a Finn-Power Express Bender automated bending machine that its engineers credit with eliminating several assembly

operations—riveting for example. We saw one complex formed part fabricated on the bender that previously was made from five separate parts.

A second Halton plant, Halton Marine in Lahti, Finland, manufactures food-service products such as exhaust hoods and ventilated ceilings, as well as HVAC equipment for ships and offshore installations. The plant installed in early 2003 a robot-tended press brake to work three shifts (lights-out on the third shift) to feed hungry assembly lines. An automated guided vehicle keeps the robotic press brake equipped with blank stacks while a six-axis robot rides a 12-m-long track to move blanks to and from the 3-m 160-ton press brake.

Robotic Brake Fuels Growth of Startup Job Shop

Since 2001, the Metallilaitte Oy plant in Riihimäki, Finland, a division of Metalliset Group, has seen its volume dou-

ble, and it expects growth to continue. The two-year-old Metallilaitte plant provides sheetmetal components for customers making elevators, cranes and appliances (its latest growth spurt has come from stainless-steel fabrication of refrigerators and other kitchen goods).

It’s here where we viewed the Finn-Power E-Series servo-electric turret press with material load and unload. It feeds a robotic press brake, installed in August 2003, which works three shifts to produce grocery-store fixtures for the plant’s newest customer. These are shelves fabricated in several sizes, in lots of 300 or more.

Linear-Drive Technology Hits Punch/Laser Combo

Linear-drive technology has in recent years brought benefits to most every type of metalworking machinery, taking speed and precision to new levels. In 2002 Finn-Power added linear-drive technology to its punch-laser combination machines with the introduction of the Laser Brilliance cell, which we saw operating at sheetmetal job shop Lakeuden Levytyö Oy in Seinäjoki, Finland. Its primary product niche is postal-sorting equipment, which has it manufacturing a variety of shelves and carts. The company operates seven press brakes, a laser-cutting machine with load/unload, a Finn-Power Shear Brilliance punch/shear cell (also with linear-drive technology) and the Laser Brilliance cell, purchased in 2003.

The Laser Brilliance at Lakenden Levytyö uses a 3.5-kW laser to cut aluminum work to 6 mm thick and stainless steel to 8 mm thick, and includes a built-in tapping unit. It can handle sheets to 3 by 1.5 m. The investment in laser technology has helped Lakeuden Levytyö develop its growing prototype business while minimizing any interruption to production. It has 150 cus-



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tomers and runs jobs as small as five to 10 pieces.

From here we traveled to Vaasa, Finland, to visit a former ABB plant now owned and operated by Incap Electronics Oy. The plant makes transformer components and is built around a Finn-Power Night Train material-management system. The 40-m-long Night Train stores raw sheetmetal blanks and partially processed work on 300 shelves. A pair of Shear

Genius punch-shear combination machines toil on one side of the Night Train and six press brakes work on the other. Sheet automatically moves in and out of the Night Train to keep the work flowing with minimal, or sometimes no, operator intervention.

InCap purchased the Night Train in 2000, shortly after taking over the plant from ABB, and boasts a 100-percent productivity jump from its sheetmetal-fabrication area as a result of the investment. The 97,000-sq.-ft. plant processes 5000 tons of sheet per year, primarily 1- to 3-mm-thick galvanized stock. The Night Train allows the shop to run an unmanned third shift.

Off to Italy

From Vaasa, our journalistic assemblage hopped a flight to Italy where we darted in and out of several highly automated sheetmetal shops. First stop was Fratelli Tamellini, a 22-employee family-owned job shop housing a 55-m-long Night Train. The firm runs a laser-punch combination machine and shear-punch machine over three shifts, and an automated Finn Power Express Bender over two shifts, making primarily components for office furniture, kitchen appliances and electronic assemblies.

Among the work we saw underway was bending of prepainted doors used in prefabricated construction. The plant manager boasted of the ability to form the panels without stretching the sheetmetal, in order to avoid cracking the coating. Each door requires 20 bends,

and the machine turns out 50 doors per hour.

Our tour then took us to what is referred to as "stainless-steel valley," where a concentration of stainless-steel fabricators resides in and around Pordenone, Italy. Here we toured Tecninox, a stainless-steel fabricator serving the restaurant-kitchen equipment market. It, too, operates an Express Bender, purchased in December 2002, to take on bending work that the firm says would have required the purchase of two press brakes.

Express Benders come in four models with maximum bend length from 65

to 127 in., for sheet to 137.7 in. long in widths to 64 in. The bender typically works a blank at its edges, starting at the external edge of a sheet and continuing to the internal part of the sheet to complete a sequence of bends. A manipulator holds the work during all manipulation phases of the process, and bends can be made upward and downward.

Tecninox, which operates a Model EB 3 (65-in. bend length) bender, processes 3000 kg of stainless steel per day, punching on two shifts and bending on one. The bender provides setup-time reduction, flexibility and automatic tool changes that yield a



Several of the sheetmetal-fabrication shops we visited throughout Finland and Italy center around a Finn Power Night Train material-management system comprising long lineups of stacked sheet-storage racks. Often, a combination of punch-laser, punch-shear, stand-alone punch and stand-alone lasers work on one side of the Night Train (top, a punch-laser), while press brakes and automated bending machines (bottom, an Express Bender) work on the other side.

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40-percent increase in productivity, the firm says, over press brakes.

All New in 2002

Textile-making machines—that's the business that keeps Megal Arredamenti Metallici busy. Half of this 54-employee firm's business is textile-making machinery, the other half job-shop work. In 2002, this small \$4-million-Euro firm purchased a laser-punch combo, a Night Train flexible-manufacturing system, a shear-punch combo and an Express Bender. Since, it's seen a 50-percent increase in production volume, and expects to nearly double its revenue in 2004.

Touring the 86,000-sq.-ft. sheetmetal-fabrication plant, we spied the one-year-old bender performing a step-bending sequence to form rolled edges onto 2-mm-thick stock for a television stand. A 54-m-long Night Train handles stock for the plant that ranges from 0.6 to 6 mm thick; 70 percent of the sheetmetal that runs through is mild steel, for textile machinery; the remainder is stainless steel, for subcontract work.

From here we traveled to a shop in Verona dedicated primarily to stain-

less-steel fabrication, Mondial Forni, which designs and manufactures bakery and pastry-making equipment. A 70-m Night Train and the largest Express Bender available, 127-in. bend length, handle the long sheetmetal parts needed to manufacture equipment that the firm sells to pizzerias, bakeries and restaurants. The 108,000-sq.-ft. plant also houses a shear-punch combination machine, although management plans to replace it in 2004 with a Laser Brilliance punch-laser combo for improved edge quality and fitup.

The Longest Train in Italy

Nearing the end of our technology tour, we next traveled to a large subcontract shop, Iltom. Iltom's 110-m long Night Train feeds a pair of Shear Genius punch-shear combination machines and a Shear Brilliance linear-drive combination machine (purchased in early 2003), three stand-alone turret punch presses, a punch-laser



Lakeuden Levytyo Oy, Seinajoki, Finland, manufactures postal-sorting equipment, fabricating a variety of shelves and carts. Investment in laser technology has helped the firm develop its growing prototype business while minimizing any interruption to production.

combo, two automated benders and an FPL 6 flying-optics laser-cutting machine. Management built the plant in 1999, and designed it around the huge Night Train.

We left the very busy Iltom shop for our final visit, to an Otis facility in Milan that manufactures elevator cars. The plant has seen enormous growth in production volumes and now manufactures 7000 cars per year, up from 1500 per year in 1992 and 4000 per year in 1995. It's brought in much new sheetmetal-fabrication equipment to handle the work, and now boasts a capacity of 11,000 cars per year.

Volume took its biggest jump in 2000, prompting the plant to invest in a new Shear Genius punch-shear machine, an Express Bender and a new Night Train to minimize outsourcing. The new equipment provides the flexibility needed to satisfy demands for custom designs and sizes of cars. Lead-time reduction requirements also drove the investments, and the plant now quotes a three-day lead-time compared to a one-week lead-time in 1999. **MF**



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