

# Sheet metal fabricators have choices

*Be as lean and automated as you can be*

By Jim Lorincz

In a sheet metal fabricating plant in Finland, linear motors, on a standalone laser machine with automated loading, position the x/y axes simultaneously at 11,811 ipm (300 m/min) for laser cutting 1-mm stainless steel panels at 787 ipm for self-cleaning galley range hoods for cruise ships.

In another fabricator's plant in Finland, also a supplier to the marine industry, panels for ventilation systems for cruise ships are processed on two high-production bending machines with integral manipulation of sheet stock and automated load/unload.

In northern Italy, a large manufacturer of baking ovens bends and punches stainless steel panels and forms intricately shaped corners without special tooling in an automated flexible manufacturing cell.

## Lean thinking

These are but a few examples of how European sheet metal fabricators in Finland and Italy are matching the capability of advanced sheet metal machines and systems to their production needs. They were encountered on a recent visit with Finn-Power International's customers in both Finland and Italy where Finn-Power's manufacturing facilities were also toured. In Italy, Finn-Power manufactures its precision CNC bending machine, the Express Bender.

Finn-Power, like most successful machine tool builders, has recognized

the importance of continually incorporating the latest technology into its products. Its customers have benefited from this commitment to the lean thinking associated with its products since the late 1980s.

By definition, in a lean-thinking or-

major leap forward in 1983 when it introduced a standalone NC hydraulic turret punch press. As early as 1987, Finn-Power started automating consecutive work stages into flexible manufacturing lines when it introduced the first combination machine with integrated hydraulic right angle shear and turret punch press (Shear Genius). For Finn-Power's customers this machine initiated the trend toward standalone machines with multiple functions that offered a flexible solution to sheet metal processing.

Since then the company has made its machines capable of standing on their own as cells by combining basic bending, punching, and cutting processes to produce machines that punch/shear, punch/laser cut, or punch/form/tap/laser cut—all on one machine. Linked together with automation, these machines form complete

manufacturing systems that can be extended by adding new workstations as production volume requires.

## Working sheet metal

Sheet metal fabricators typically work aluminum, cold roll steel, and stainless steel sheet in thicknesses ranging from 0.02" to 0.315", in sheet stock 5x10 ft. up to 5x13 ft. Turret punch presses are effective in processing steel up to 8 mm (0.314") thick; shearing can handle material up to 5 mm (0.196") thick. Product combinations have been



At Halton Marine, linear motor drives position the x/y axes at 11,811 ipm for laser cutting 1-mm stainless steel for range hoods in the galleys of cruise ships.

organization product and process development and operations are managed so that it takes less human effort, less space, less capital, and less time to make higher quality products—with fewer defects. Lean thinking streamlines operations, eliminates waste, and identifies and implements the equipment and procedures that contribute to the value stream—whether inside the operation or, originating from the external supply stream.

Finn-Power's entry into the sheet metal industry's supply stream took a

developed to handle virtually any customer requirement based on production needs and future growth. Finn-Power's newest 3.5 kW laser machine, for example, can cut metal to 0.75" with high-speed linear motor positioning handling sheets up to 5x10 ft.

Finn-Power offers something for most any sheet metal fabricator's production needs. Here's the latest lineup of its products:

■ Standalone NC turret punch presses are available in 22- and 33-ton in both hydraulic and servo-electric versions for processing sheets from 50"x100" to 5x12 ft. with upforming to 0.63" for louvers etc. Models include "A" and "F" series hydraulics and Express E5 servo-electric.

■ Shear Genius "SG" Flexible Manufacturing Cell is designed for lean manufacturing and work in process reduction, performing load, punch, shear, unload in 33-ton version for processing sheet 50"x100" to 5x12 ft.

■ Shear Brilliance "SB" incorporates linear motor technology for high-speed positioning for combination load/punch/shear/unload with 33-ton punch and 30-station turret on sheet 5x12 ft.

■ Laser Punch "L+P" features automated part production including load/punch/laser cut/unload with 33-ton hydraulic turret punch press and 2.5kW laser for processing sheet 5x10 ft.

■ Laser Punch LPE is a servo-electric version of the automated machine with high accuracy for load/punch/laser cut/unload with 22-ton punch for 5/16" sheet 50"x100" and 2.5 kW laser.

■ The Finn-Power Laser FPL-6 integrates linear motor drive in a standalone laser for laser cutting sheet 0.75" thick and 5x10 ft with positioning of 11,811 ipm and laser cutting of 787 ipm.

■ Express Bending Cell "EB" is the latest iteration of its fully automatic bending machines with rotational manipulation of the part with a capacity to 0.12" thick and 10.5 ft. long up to

flange of 7.87". The Express Bender works the edges of the panel. Generally, the process starts at the external edge of the sheet and continues to the inner part of the sheet, working one side after another in sequence until all bends are completed.

Other products include press brakes and robot-fed press brakes.

### Advancing technology

Finn-Power has continued to integrate high-speed positioning into its products through the use of linear motor drives. Finn-Power has integrated linear motor technology onto



Modern Applications News' publisher, Bob Olree, points as the self-cleaning feature of the Halton self-cleaning range hood is explained.



Intricately curved stainless steel panels (inset) are formed without special tooling for bakery ovens at Mondial Forni on a Night Train FMS cell that comprises Finn-Power's Bending Automation and a Shear Genius machine.

its combination shear/punching machine (Shear Brilliance); its state-of-the-art standalone laser-cutting machine (the FPL-6 model), and, most recently, on its combination punch/laser cutting machine (Laser Brilliance). In addition to being ultra fast, the linear motor positioning system is extremely accurate.

Here's what visitors to Euro-Blech saw when the Laser Brilliance "LB" machine was introduced late last year. The "LB" machine allows contouring speeds up to 100 percent faster than conventional ball screw-driven systems. The "LB" combines a hydraulic 30-station, 33-ton punching and utilizes linear drive technology for ultra-fast extremely accurate positioning throughout the full 20 feet of X-axis travel. Axis positioning speed reaches 8,976 ipm (228 m/min), as well as laser cutting speed of 787 ipm (20 m/min).

Material flow can be automated in several ways. At its introduction in Hannover, the Laser Brilliance was exhibited with a 5-axis loading, sorting, and stacking robot, as well as a sorting unit with eight addresses. Or the Laser Brilliance can be equipped with flexible modular material handling equipment like a cell concept using Finn-Power's new, compact FPS raw material storage. And, of course, it can be integrated into a Night Train FMS system.

### Taking the Night Train

Finn-Power approaches automation first as an on-machine opportunity to create a cell with multiple functions and then as an opportunity to join machines together into a flexible manufacturing system. The most basic form of automation is loading and unloading to reduce human interfer-

## Production

ence with the process and to complete sorting and stacking of individual components as final products or for secondary operations.

To achieve production goals that can range from small lot runs to full production runs, the company has developed a flexible manufacturing system that integrates machines into cells with flexible automation that "integrates the machines seamlessly from part to part and operation to operation."

That's how Mikko Lindstrom, president, Finn-Power USA, describes the capability of his company's Night Train Flexible Manufacturing System. In addition to punching, shearing, and/or laser cutting, the Night Train allows the addition of robotic press brakes or an in-line automatic panel bender to automate the component bending process.

The benefit to the fabricators is that they can "bend only the parts that are needed today and be able to bend parts in different sequences than what they were punched to match their assembly needs, thus eliminating extra work in process while increasing throughput," Lindstrom explains.

The Night Train FMS incorporates both the successful applications of both Finn-Power Flexible Manufacturing cells and its Automatic Material Management Systems to provide a total solution for unmanned operation in sheet metal fabrication shops. The Night Train automates system control, equipment operation, as well as material flow within the system through a new type of automatic storage for raw material and finished components.

The Material Management System of the Night Train FMS holds all needed blank sheets. Punched and fabricated parts are automatically stacked on pallets and transferred to the Material Management System via the Night Train Wagon, allowing for long periods of unmanned operation.

A further advantage of the Night Train FMS system is that existing or legacy fabrication equipment, as well as new equipment sporting the latest technological innovations, can be integrated into the system to further automate the manufacturing process.

### About the customers visited

Halton Marine is a global supplier of HVAC for cruise ships, especially for cabin ventilation, galley ventilation and fire safety products, such as



**Top:** The Night Train FMS cell at Mondial Forni with Shear Genius with special enclosure in foreground and Bending Automation machine.

**Bottom:** At Koja Ltd, the Finn-Power Express Bender uses its unique manipulator to work the edges of the panel, starting at the external edge of the sheet and indexing each side in sequence until all bends are completed.



fire dampers as well as air flow management and air distribution in onshore applications. In addition to the linear-motor FPL-6 laser it has a Shear Genius and an Express Bender on order and a Night Train FMS that will be installed. It has manufacturing plants in Finland, France, the U.S., and Malaysia.

Koja Ltd. manufactures and markets air handling (HVAC) units for industrial, commercial, office and public buildings as well as fans for industrial applications. Koja has the latest Finn-Power automated CNC bender, the Express Bender, a Bending Automation machine, a Shear Genius, and a Shear Brilliance machine on order.

Mondial Forni is an Italian manufacturer of refrigeration and bakery and pastry ovens, mixers, blenders, and related equipment. The company's Night Train FMS comprises an "SG" combination shear and punching machine and a Bending Automation bender to produce special curved panels without using special tooling.

# SURVIVOR

**IT'S A  
JUNGLE  
OUT  
THERE...**

**ARE YOU  
EQUIPPED TO  
MEET THE  
CHALLENGE?**



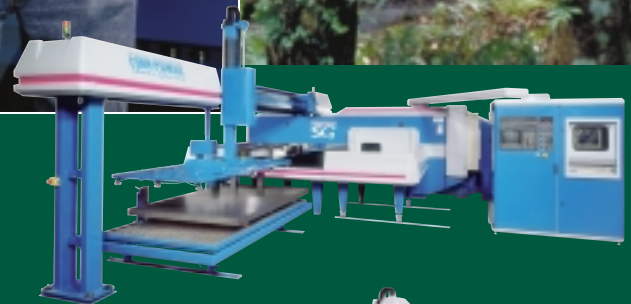
***Finn-Power customers not only survive...but prosper.***

It's no secret that today's sheet metal fabrication market is the most competitive and volatile in recent history.

Finn-Power Flexibility provides modular design to allow our customers to add automation at any time. It provides the products and processes for "lean-thinking" fabricators to reduce direct labor costs and manufacture with less floor space, and in less time, to produce higher-quality products in any quantity. Finn-Power Flexibility streamlines operations and eliminates waste, while matching the right machine, cell, or system to the individual production need.

Whether your fabrication need is to punch, form, shear, upform, mark, tap, laser cut, bend, load/unload, utilize full FMS automation... or anything in-between, Finn-Power has the Flexible, Lean Manufacturing Solution for your company.

Contact us to obtain a free copy of our ***Quick Guide to Higher Productivity***. Learn how Finn-Power Flexibility can add to your company's bottom line in all market conditions.



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