

POWER *Line*



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CUSTOMER PROFILES • NEW TECHNOLOGY • PRODUCTIVITY • FLEXIBILITY

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Together We Grow...Sharing Our Success with Employees, Customers, and Stakeholders

By Ezio Basso, Prima Industrie Managing Director, Prima Power Division



Ongoing growth and improvement is our commitment. This has always driven us to invest in the continuous innovation of our products and services and in the expansion of our geographical presence. We stay close to our customers and help them succeed in their day-to-day challenges by being present where they are, listening to their needs, and delivering cutting-edge technology suitable to their production.

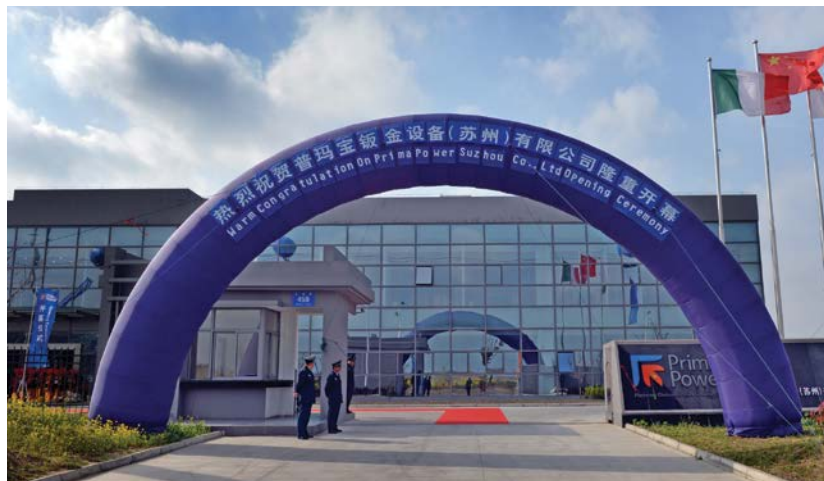
All the latest new products – Laser Next, Platino 2.0, Shear Brilliance, and the LPBB line, just to mention a few – were successfully received by the market. Lately, we have also increased our investments in high-growth geographic regions to establish new facilities, particularly in China, India, Mexico, and in Eastern Europe.



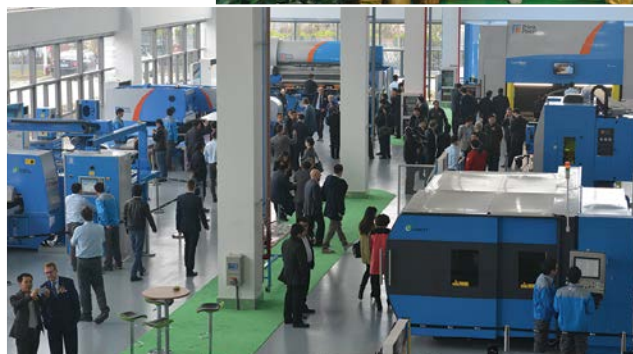
The first months of 2015 were distinguished by an important event, which exemplified our company's growth. A grand opening ceremony was held on March 26 to mark the official start of production in China at Wujiang, Suzhou, Jiangsu province. Prima Power Suzhou's official opening celebrates a major milestone in our history and represents a decisive step in improving our geographic coverage of China. It also demonstrates our strong commitment to our local customers and business partners, as well as our constant goal to be where our customers are in order to react faster to their requirements.

We see huge growth for our sector in China, and the new facility will accelerate our development in this country. Located 80 km west of Shanghai, and covering an area of 8,000 square meters, the new plant is designed for manufacturing, sales, and after-sales of a broad range of machines for sheet metal processing. A Tech Center dedicated to Chinese and Asian customers is also available in the same area.

Thanks to the support from the local government, the construction



of the plant has been completed within 10 months. The opening ceremony was exciting and impressive, with the lion dance and eye dotting traditional ceremony and the official ribbon cutting. I wish to thank all the Chinese and Italian authorities who supported us in this project and took part in the ceremony, the 350 guests who attended the inauguration, and all our customers and partners. This success would not have been possible without them. A special thanks goes to all our employees who have contributed with their hard work and commitment to this important event.



This year we have also started the building of a new Tech Center in Collegno, Torino, Italy, a further investment to improve our customers' experience with centers of excellence for demonstrations, cycle time studies, training, and consultancy. We will keep you informed on this further step forward in our growth strategy.

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Unison Clears the Air on Automating Sheet Metal Fabrication

Unison Comfort Technologies® was established in 2010 as the parent organization of Innovent®, Valent® and Precision Coils. Tracing its market legacy to 1981, today Unison designs, manufactures, and provides air handling products that ventilate, dehumidify, filter, and heat or cool air. The company's mission is to deliver products that reduce energy consumption and building operational costs.

Unison is headquartered in Minneapolis, MN, with additional manufacturing plants near Sacramento, CA and Memphis, TN. More specifically, its three businesses include:

- Innovent Air Handling Equipment is a custom manufacturer of commercial/industrial air handling systems, energy recovery units, desiccant dehumidification products, and pool dehumidification units. Innovent products are installed in a wide range of facilities including educational, health care, industrial, government, hospitality, recreational, research, and retail buildings.
- Valent Air Management Systems manufactures high-percentage outdoor air packaged rooftop units that address the needs of building owners, specifying engineers, and installing contractors. Valent units serve in dedicated outdoor air comfort and process applications in facilities ranging from educational buildings and lodging facilities to laboratories, industrial operations, and commercial properties.
- Precision Coils specializes in manufacturing competitively-priced, precision-engineered HVAC heating and cooling coils. Precision Coils offers a full range of HVAC replacement coils.

In 2013, Unison began its search for more productive and efficient fabrication equipment. At that time, both Innovent and Valent had



Jacob VandeHei, manufacturing engineer, inspects a part processed on the Prima Power EBe servo-electric Express Bender.



Unison designs, manufactures, and provides air handling products that ventilate, dehumidify, filter, and heat or cool air. The company's mission is to deliver products that reduce energy consumption and building operational costs.



separate and older fabricating and forming lines at different areas in the 180,000-square-foot Minneapolis facility. However, both companies also manufactured a wide range of similar rectangular panels for their products. The decision was made to combine production and bring it together in one location for more efficient planning and cost efficiencies. According to Jacob VandeHei, manufacturing engineer, Unison's challenge was

“We looked at high-speed punch presses, different types of lasers, and combination machines. Ultimately we decided on the Prima Power PSBB Line. We discovered that we could most easily maintain single part flow with the PSBB line, eliminate all the in-between processing handling time, and also reduce our WIP.”

to also improve their processes in order to keep up with increased demand. “We began to look at other options,” he explains. “We had a FastBend panel bender from Prima Power that was performing well and producing high-quality parts. While visiting the Prima Power facility outside Chicago, I inspected the Shear Genius punch/shear. And as we fine tuned the project and explored the options available to us, we discovered that we could really benefit from a complete automated fabrication line.”

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Unison Clears the Air on Automating Sheet Metal Fabrication

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PSBB Line

“We explored many options,” VandeHei continues. “We looked at high-speed punch presses, different types of lasers, and combination machines. Ultimately, we decided on the Prima Power PSBB Line. We discovered that we could most easily maintain single part flow with the PSBB line, eliminate all the in-between processing handling time, and also reduce our WIP.”

The Prima Power PSBB is a compact, flexible manufacturing line that processes blank sheets into high-quality components that exit fully bent. The PSBB concept includes the following functions:

- system design
- software
- machine tools and cells
- material handling automation
- customer support and service
- automatic storages and flexible buffering



Material flow can be arranged in flexible ways to transfer parts directly to automatic bending, to balance the different time requirements of bending and punching/shearing, to exit material from the system, and to bring new material into it.

The combo storage allows processing of components from a variety of materials, which can be changed, as programmed, automatically. The sheets are transferred into a Shear Genius punch/shear cell. After shearing, the components are sent to buffering and subsequent bending in an automatic bending cell.

“With our older turret punch press, we were running about 7-8 minutes per sheet compared to the 3½ - 4 minutes with the Prima Power SGe. That’s a 2-to-1 increase in productivity.”

Material flow can be arranged in flexible ways to transfer parts directly to automatic bending, to balance the different time requirements of

bending and punching/shearing, to exit material from the system, and to bring new material into it. The flexible and versatile buffering function ensures that optimum operation in terms of manufacturing cost and throughput time can always be chosen, whatever the manufacturing task. Flexible buffering ensures optimal operation of integrated machines.

The main components of the PSBB line include:

- Shear Genius servo-electric punch/shear combination SGe8
- Buffer tables
- Express Bender servo-electric EBe6

Servo-Electric Shear Genius

With the Shear Genius concept, the objective is to provide a machine capable of transforming a full-size sheet into finished parts. These parts can be moved to the final production stages for immediate integration directly into the final product assembly.

The heart of the servo-electric Shear Genius SGe is an updated servo electric 30-ton punching machine with 1,000 hpm stroke speed, 250 rpm index speed and 150 m/min sheet positioning speed. The right-angle shear has a servo-electric actuation system, which makes shear movement both fast and fully controlled for maximum productivity.



The combo storage allows processing of components from a variety of materials, which can be changed, as programmed, automatically. The sheets are transferred into a Shear Genius punch/shear cell. After shearing, the components are sent to buffering and subsequent bending in an automatic bending cell.

“We really like the loading system with the wagons that allow a sheet to process as it preps the next one,” explains VandeHei. “In just a matter of seconds, it transitions into the next sheet. We wanted the loading and unloading to be as ergonomic as possible. There is no more shaking out parts, no more loading the sheets by hand. Our SGe also runs 24/7, although we have staff available on each shift. We’ve also eliminated skeletons by taking advantage of common-line cutting. With a traditional punch press, typically there would be about ¾” - 1” of space between the parts. We have very rectangular parts, so the right-angle shear was a perfect solution for us. We were able to nest more parts and to achieve better sheet utilization. With our older

turret punch press, we were running about 7-8 minutes per sheet compared to the 3½ - 4 minutes with the Prima Power SGe. That's a 2-to-1 increase in productivity. We also really like the ink jet printer option. It saves us a lot of part-marking time."

Buffering

Material flow can be arranged in flexible ways to transfer parts directly to automatic bending, to balance the different time requirements of bending and punching/shearing, to exit material from the system, and to bring new material into it. The flexible and versatile buffering function ensures that optimum operation in terms of manufacturing cost and throughput time can always be chosen, whatever the manufacturing task at hand. Flexible buffering ensures optimal operation of integrated machines.



The Prima Power PSBB is a compact, flexible manufacturing line that processes blank sheets into high-quality components that exit fully bent.

"The buffer helps to level the work load between the Shear Genius and the Express Bender," explains VandeHei. "The buffer holds the parts and releases them in a measured manner down to the bender. It also allows the SGe to remain running as fast as possible."

"To form that part on a traditional brake, we would end up flipping it 8 times, and now we can form that part in just 45-50 seconds."

Express Bender EBe6

The EBe servo electric Express Bender is a bending solution that is designed specifically for each fabricator's production requirements to achieve maximum productivity, quality, and repeatability. The bending operation is fully automated, from the loading of flat punched parts to unloading of the finished product.



The EBe servo electric Express Bender is a bending solution that is designed specifically for each fabricator's production requirements to achieve maximum productivity, quality, and repeatability. The bending operation is fully automated, from the loading of flat punched parts to unloading of the finished product.

The EBe bender has a maximum bending length of 131" (3,350 mm) and a maximum opening height of 8" (200 mm). The proven construction features actuations of the bending blade movements (vertical and horizontal) by NC servo axes instead of hydraulic cylinders. The upper tool movements are also made by another NC servo axis. Prima Power EBe provides the high bending quality required in demanding applications. The quality is achieved through precise control of bending axes, fast and smooth bending motion, programmability, and rigid construction that is immune to variation in thermal conditions.

"One of the greatest benefits of the EBe is its ability to do negative flanges and positive flanges at the same time without flipping the part over," says VandeHei. "That's an important feature because we have door panels that have nine forms and four negative bends on it. To form that part on a traditional brake, we would end up flipping it 8 times...and now we can form that part in just 45-50 seconds. Another big benefit we have experienced with the EBe is the ability to parametrically create bend programming. It can do this on the fly, with no human intervention. This saves us a ton of programming time."

"By automating, we were not cutting jobs. The number of employees is growing, but in different areas. We are taking out the grunt work and creating better, higher-tech jobs."

Quality Products

According to VandeHei, quality parts are the real benefit that Unison has received from the PSBB line. "Many times the visual impact of the unit is how people measure the internal quality of a product," reflects VandeHei. "We design the interior of our components to the highest level of quality, so it is really important for us to have the exterior of our products match that same level of quality... and the PSBB line, and especially the bender, helps us achieve this. It has helped us produce high-quality, scratch-free parts. It helps produce these parts a lot easier than before. It is very precise and consistent."

New Opportunities

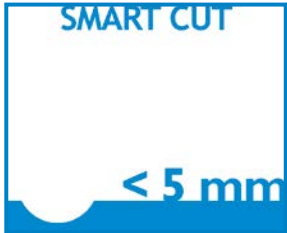
"When we designed the new plant layout, we brought new equipment on line and many of our employees were shifted into different roles," says VandeHei. "By automating, we were not cutting jobs. The number of employees is growing, but in different areas. We are taking out the grunt work and creating better, higher-tech jobs. For example, we no longer have to shake out parts or load heavy sheets by hand. We can't hire fast enough for our new production jobs."

"Our new Prima Power PSBB line has been a life saver when you consider the amount of growth we have recently experienced," concludes VandeHei. "The efficiency of the PSBB has been fantastic. It has eliminated a great amount of non-value added time between stations. As a result, from sheet metal to a finished panel, we went from days to hours. It has been a real game changer, and we shudder to think what would have happened if the line had been installed a few months later. The PSBB line has helped us reach production levels that we could not have reached without it."

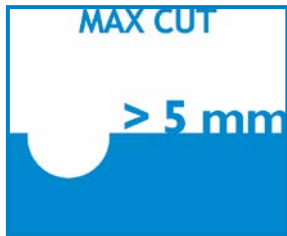
Platino 2.0 Fiber... Tailored to Your Application

The new 2.0 version of the Platino Fiber laser machine by Prima Power has been developed to maximize our customers' competitiveness.

A series of option suites is dedicated to the different production needs:



SMART Cut – for fast cutting of thin sheets (up to 5 mm) where N2 technology can be applied, allows a reduction of the cycle times up to 30%. Smart Moves and Grid Cutting are some of the technological solutions contained in this suite.



MAX Cut – for the fast cutting of medium-thick gauge sheets, makes it possible to reduce processing times up to 40% due to Nitrogen Piercing and Hi.Piercing, which increase piercing quality while lowering the cycle time.



NIGHT Cut – for intensive production, provides a higher piercing and cutting process safety. LPM (Laser Piercing Monitor), Plasma and Tip-Touch Restart, and email dispatching are some of the functions contained in this suite.



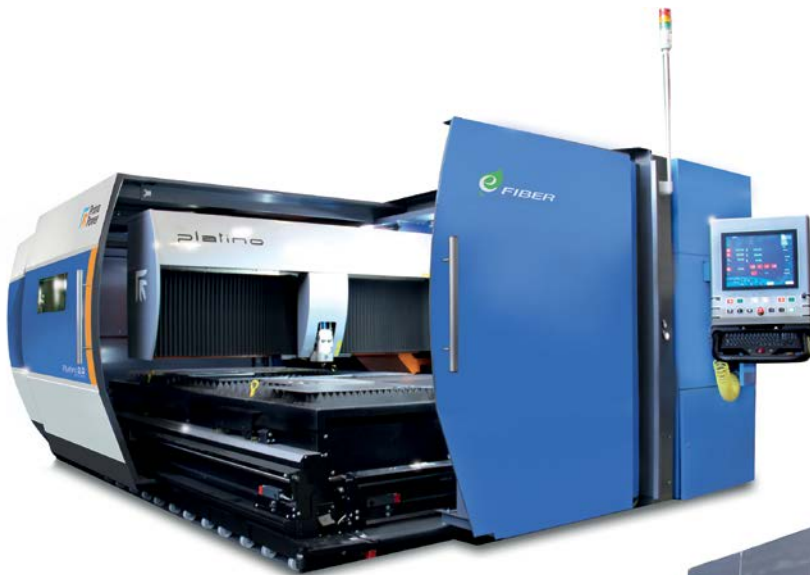
Tried and Tested Platform with Innovative Solutions

These suites add further value to a high-performing, flexible, and reliable machine, based on the tried and tested Platino platform with almost 1,800 installations across the globe.

Platino 2.0 Fiber is available with high brilliance, energy-efficient fiber lasers from 2 to 5 kW. Platino 2.0 Fiber head, dedicated to fiber technology, is supplied with a single lens suitable for all applications, an optional automatic nozzle changer, and includes advanced sensors. All this and many other features make it an accurate, versatile, and efficient machine even in case of 24/7 non-stop production.

The protection cabin is available in two versions: LEAN, faster to install and with an attractive price, and OPEN, with higher accessibility and visibility of the work area.

A wide range of modules for the automation of the material flow meet customers' expectations, even when the production needs vary with time: from automatic loading/unloading to storage, from selection and stacking of finished parts, to the integration with a flexible manufacturing system (FMS).



Successful Opening Ceremony for New China Plant

The Prima Industrie development process in the Chinese market continues. On March 26, the manufacturing plant of Prima Power Suzhou was officially inaugurated in Wujiang (Suzhou - Jiangsu province), 80 km west of Shanghai, in the presence of the Chinese and Italian authorities.

The plant, which covers 8,000 square meters and which will employ more than 100 personnel, will host manufacturing, sales and after-sales activities for a wide set of machines for sheet metal processing (2D laser cutting, punching, press brakes). In addition to manufacturing area and HQ offices, the plant features a large showroom that will welcome Chinese and Asian customers. Inside the plant, an area is set aside for the arrival of import items from the European plant but destined for other countries without custom duty.

The Prima Industrie policy is to produce medium-range machines in China, while the rest of the products will continue to be manufactured

in the Turin and Verona plants in Italy, at the Finn-Power Oy site in Finland, and at the Laserdyne Champlin, Minnesota plant in the United States.



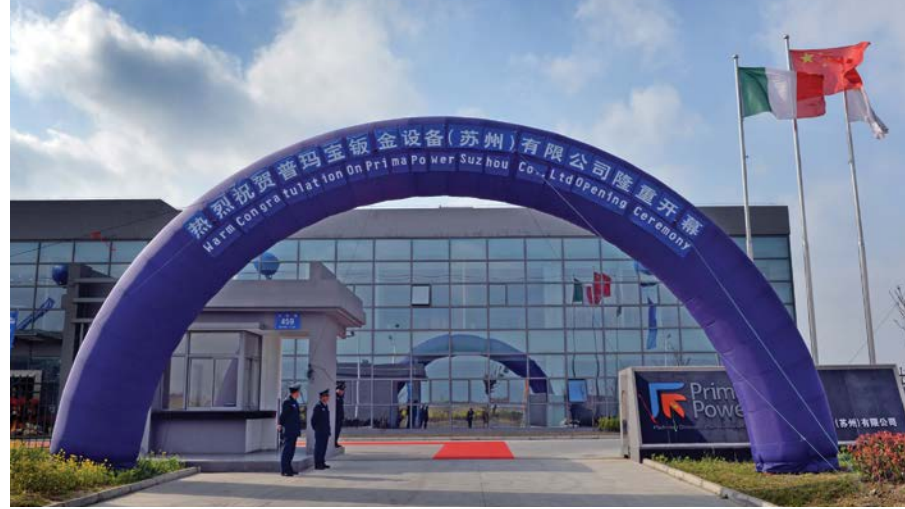
The Chinese market represents approximately 40% of the worldwide market of machine tools, and is the second end market for our Group after the United States.



During 2014, the commercial network of the Group in China has been reorganized, with a greater direct presence and sales and after-sales units in four areas of the country: The Northern area managed by Beijing, the Western area directly managed by the Company in Suzhou, the Eastern area where an office in the Wuhan area will shortly be established, and the Southern area (including Hong Kong) in which the Group shall take advantage of the cooperation of LEEPOT distributorship.

The Secretary of the Wujiang Committee of the Communist Party of China (Liang Yi Bo), the Vice-Mayor of the city of Suzhou (Xu Ming) and the Ambassador of Italy in Beijing (Alberto Bradanini), in addition to Prima Industrie Group management, all took part in the Opening Ceremony.

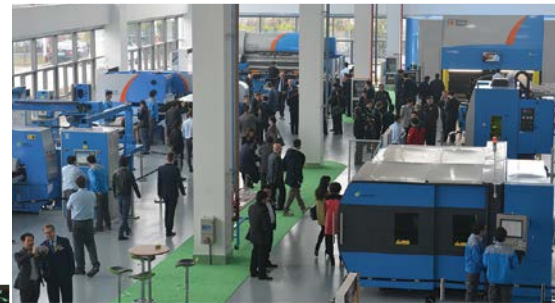
According to Gianfranco Carbonato, Chairman of Prima Industrie, "Prima Industrie revenues in China were 42 million in the year 2014 and we are confident that we will double it within the next four years,



On March 26, the manufacturing plant of Prima Power Suzhou was officially inaugurated in Wujiang (Suzhou - Jiangsu province), 80 km west of Shanghai, in the presence of the Chinese and Italian authorities.

thanks to the investments carried out in Prima Power Suzhou and to the reorganization of the commercial coverage in the country. The Chinese market represents approximately 40% of the worldwide market of machine tools, and is the second end market for our Group after the United States. This is a sign of the quick shift in the balance of the global economy. We need to have the best, but especially the most competitive and suitable product for the customers' requirements, in order to sell it worldwide and win against the strong competition."

Prima Power Suzhou is a company established under the Chinese law (WFOE) of which Prima Industrie S.p.A. owns 70%, while the remaining 30% is owned by LEEPOT Machine Tool Co. Ltd., a longtime business partner of Prima Industrie Group.



The plant, which covers 8,000 square meters and which will employ more than 100 personnel, will host manufacturing, sales and after-sales activities for a wide set of machines for sheet metal processing (2D laser cutting, punching, press brakes).



Punch it, Laser-cut it, or Something Else? The Sequel



Figure 1
Stand-Alone Turret Punch Press

Cost-effective Holemaking:	Yes
Material Utilization:	Limited
Secondary Operations:	Shaker parts, scrap handling, tab removal, deburring
Part Nesting:	Limited
Forming:	Upforming with indexing, good control, no marking
Contouring:	By nibbling, wheel cutting, or special tooling
Flexibility:	High, requires tooling
Combined Operations:	Yes with multiple tooling options (tapping, marking, etc.)
Tooling Compatibility:	Existing tooling
Part Quality:	Good accuracy, nibble marks

The emergence of fiber lasers and new forming capabilities calls for rethinking basic fabricating rules of thumb

By Lutz Ehrlich and Mike Millette

The machine tool that once was considered to be the best tool for the job 10 years ago is not necessarily the same tool a fabricator might use today to accomplish the same fabricating goals. Punch presses, laser cutting machines, and machines with both capabilities have all changed and, frankly, can do more than previous generations of technology.

Punching machines can still produce hole-intensive parts like machines of the past, but fiber laser technology, with its small spot size when compared to more traditional CO₂ laser technology, can rip through sheet metal of gauge thickness at incredible rates. Of course, fabricators can still form and perform other functions on the punching machine that can't be done on the laser cutting machine. The debate over what machine tool technology to use is not as clear-cut as it once was.

Part of the debate is the combination machine, either a punch/laser or a punch/shear. These machines obviously can accomplish much more without the need for an operator to move the part from one operation to another, but a fabricator may not have the right part mix or production goals to justify this type of investment. Again, more information is needed to decide what makes the most sense for a fabricating operation.

Ten years ago *The FABRICATOR* took a look at this array of equipment. Today it revisits that topic.

The Technology Lineup

The machines discussed here are:

- Servo-electric turret punch press with up to 16 auto-index or multitool stations. The auto-index feature allows for wheel capability and multiple indexable shapes for contouring.
- Flying-optic fiber laser.
- Punch/laser combination machine that uses both fiber laser technology and servo-electric punching power.
- Punch/shear combination machine that relies on servo-electric power.

Other machine tool technology is available to accomplish cutting and punch tasks, but these machines present a robust lineup that most fabricators are familiar with. Laser cutting, punching, and shearing are known quantities in the fabricating industry.

However, before any investigation into a fabricating technology can take place, a fabricator needs to realize that the part mix and production goals are the ultimate factors influencing the decision to consider a punching, laser cutting, or some sort of combination machine. Some of the questions that guide this conversation are:

- How much more capacity is needed for production needs?
- What is the mix and volume of work that needs to be addressed with the new fabricating technology?
- Does the fabricating operation need to reduce work-in-process?
- Is the company trying to reduce labor costs?

- Is there a desire to eliminate material handling by combining operations?

With those answers clearly identified, a fabricator can decide which fabricating technology is the best fit for the shop.

Stand-Alone Turret Punch Press

Equipment-makers' and tooling suppliers' combined expertise has positioned the turret punch press (see Figure 1) as a versatile and cost-effective machine tool that can accomplish many tasks. The equipment's ability to eliminate secondary operations – performing those functions while the part remains on the same brush table – helps it to stand out.

From a strictly productivity standpoint, turret punch presses have improved greatly over the years. Hits per minute are up to 1,000. Sheet positioning speed has improved up to 492 FPM (150 m/min.). Index speed has reached 250 revolutions per minute. Servo-electric power delivers higher-precision punching action than previous hydraulically-powered machines. The machines are punching-proficient.

The servo-electric power is noteworthy because it also contributes to precise creation of upper and lower ram movements to assist in creating flanges and upforms. In addition to those forms, the right tooling can perform contouring, marking, and even tapping.

Obviously, the type of tooling defines just how flexible punching presses can be. While this

article focuses on a 16-station turret, other punching machines are designed to have more tooling stations with several auto-index stations in the mix. Tooling, of course, has to be maintained and sharpened if it is to perform according to the equipment manufacturer's specifications.

These machines are capable of working with a variety of materials, including aluminum, stainless steel, and cold-rolled steel. These punch presses typically work with material up to about 0.315 in. (8 mm) thick.

The programmable clamping capability positions the sheet clamps according to the control instructions, minimizing clamp dead zones. When production changes from full-size to small sheets, clamp settings can be made automatically without wasting the operator's time. It must be noted that the clamps can leave marks on the material. On the other hand, upforming and lift tables are now commonly used with modern punching machines, minimizing scratching that may result as the sheet is dragged across tools that are higher than others.

Modern punching machines can be automated in several ways for unattended operation and increased capacity. This includes automation for sheet loading, parts unloading, and parts stacking. More cost-effective equipment options, such as trapdoors in the table and conveyors, can help minimize operator involvement while still offering a boost in labor productivity.

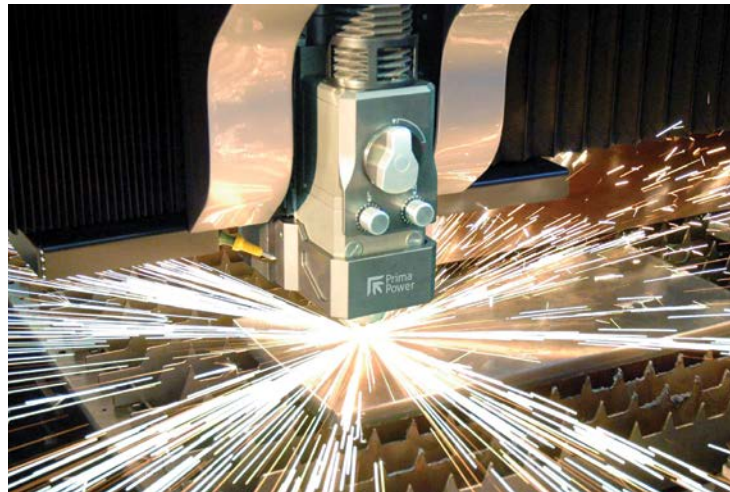
“From a strictly productivity standpoint, punching technology has improved greatly over the years. Hits per minute are up to 1,000.”

Cost of Operation. Because most turret punch presses have moved to servo-electric power, fabricators no longer have to worry about oil changes and filter management. Servo-electric punch presses also are much more energy-efficient when compared to the

hydraulic counterparts of the past. But the equipment is not totally maintenance-free; mechanical drives and wear items still require maintenance.

Stand-Alone Laser

With 40 years of production results behind it, CO2 laser technology is a known entity in the metal fabricating community. It proved incredibly useful for cutting of 2-D shapes with many curves and small features. Higher-powered resonators delivered that same usefulness for thicker materials. Advancements in production software and control technology helped to improve cutting performance



regardless of the operator's skill level may have been. Automated functions, such as lens changeout and nozzle cleaning, helped to increase productivity on these machines. Fiber laser technology (see **Figure 2**) has introduced a large and important chapter to the story of the laser cutting machine. The speeds at which these machines can traverse the main axes and at the cutting head axes (for those machines that can make this type of movement) have greatly surpassed CO2 lasers' speed. The fiber-optic cable that delivers the laser to the cutting head is extremely adaptable to higher speeds. In fact, the state-of-the-art machines equipped with multiple axes of movement can reach speeds of 10,000 IPM.

This type of technology has the potential to cut about 15 holes per second, but it may not be the best choice for a fabricator that has a lot of hole-intensive parts and simple parts with knockouts. The punch is still a cost-effective option for that type of fabrication work.

Fiber laser technology delivers a small beam focus with consistent intensity, which makes it suitable for cutting thin materials. CO2 lasers have a larger beam focus, which allows molten materials to escape more easily during cutting; this makes it the preference for those fabricators that consistently cut material 0.25 in. thick or greater. Technology has emerged to allow a fiber laser to alter its beam size so that it can cut thick materials efficiently, but at this point, additional optics technology has to be added to the laser.

Fiber laser technology in its most basic setup has no need for additional optics. Fabricators

Figure 2
Stand-Alone Fiber Laser

Cost-effective Holemaking: Yes
Material Utilization: Excellent
Secondary Operations: Shaker parts, scrap handling, tab removal, deburring
Part Nesting: Good
Forming: None
Contouring: Good
Flexibility: Limited, flat process only
Combined Operations: No
Tooling Compatibility: N/A
Part Quality: Good accuracy, high quality

also don't have to worry about things like oil or filters. The technology's simplicity makes it attractive for fabricators needing to minimize advanced training for operators or to introduce less experienced workers to laser cutting.

It should be mentioned that CO2 technology has advanced as well. Maintenance is still required, but not as much as might have been the case for machines made just five years ago.

Because a fiber laser has a 1-micron wavelength, it has the potential to damage an operator's eyes permanently. For this reason the cutting environment has to be totally enclosed with specially protected glass. There is no open cutting area as is found on a CO2 laser.

That same wavelength, however, is absorbed well by a whole range of materials. A fabricator can use a fiber laser to cut brass

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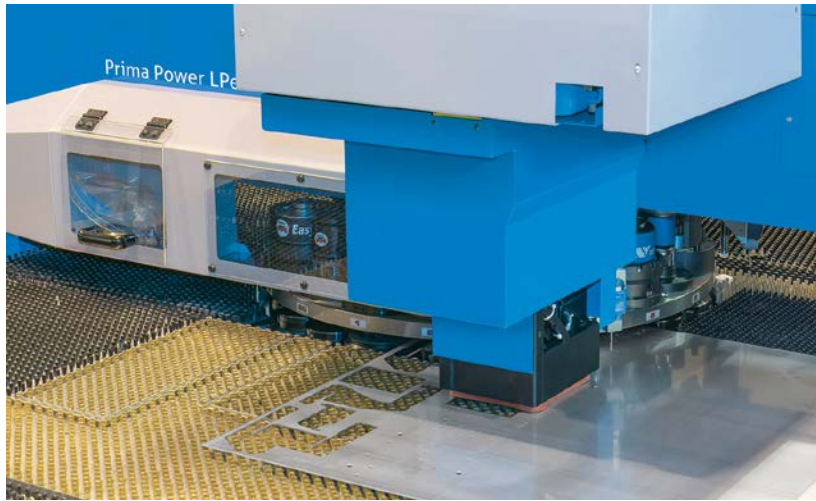


Figure 3
Punch/Laser Combination

Cost-effective Holemaking: Yes

Material Utilization: Excellent

Secondary Operations: None

Part Nesting: Good

Forming: Upforming with indexing, good control, no marking

Contouring: Good with nibbling, wheel cutting, or special tooling

Flexibility: High, no special tooling required for flat process

Combined Operations: Yes with multiple tooling options (tapping, marking, etc.)

Tooling Compatibility: Existing tooling for punching, nibbling, or forming

Part Quality: Good accuracy, high quality

and copper, something that can't be done on a traditional CO₂ laser. Even highly reflective material readily absorbs the beam's 1-micron wavelength.

The introduction of a fiber laser cutting machine disrupts work flow if the fabricator does not plan for it. Because of its high cutting speed on thin materials, parts are produced incredibly fast, which can easily overwhelm the manual part removal operation. Fabricators are advised to invest in automated sheet delivery, part and skeleton removal, and part separation technology to keep up with the machine's fast cutting capability.

Cost of Operation. A fabricator still has to pay for laser gases, such as oxygen and nitrogen, and cutting table material supports for both fiber and CO₂ laser cutting technologies. A fiber laser will have a smaller day-to-day operational cost because it doesn't require as much power and does not have the same maintenance needs as a CO₂ laser.

Punch/Laser Combination

The machine is self-explanatory: It combines punching and laser cutting in one machine (see Figure 3). The punching capability should be used for punching, forming, and pre-piercing holes for cutting. The laser is good for cutting complex contours on parts that require minimal marking or distortion or for parts for which tooling is not available. (Pre-piercing a hole with a turret punch can help to eliminate the splatter and sparking that are typical with laser piercing.)

This piece of equipment is especially useful for fabricators worried about cycle time and that want to take the necessary steps to eliminate additional material handling.

The biggest advancement in combination machines is linked to fiber laser technology. CO₂ laser sources have to be isolated from the punch so that vibration-free cutting can take place. A fiber laser power source, on the other hand, simply sits on the floor next to the table, so vibrations hardly have any effect on the laser cutting; a reliable fiber-optic cable delivers the laser light from the power source to the cutting head.

Currently the mechanics of a punching table—where the sheet is moved around—limit the speed of the fiber laser. It simply isn't designed to equal the speeds of a stand-alone fiber laser cutting machine.

If a punch/laser combination machine has a fiber laser, it needs a complete protective enclosure around the process and cutting area. The fiber laser presents the same danger as the ones used on stand-alone laser cutting machines.

The same automation options available for stand-alone punching and laser cutting machines can be added to combination equipment.

Cost of Operation. The emergence of servo-electric-powered punching and fiber laser technology has resulted in energy-sipping machines when compared to combination

machines of the past, especially considering that the CO₂ laser had to be kept live, even when not cutting, so that it could be ready to go at any time. If a fabricator elected to go with the more cost-effective CO₂ laser technology, the shop would have to be concerned with regular maintenance costs for consumables and resonator and turbine work.

Punch/Shear Combination

The turret punch press/right-angle shear combination (see Figure 4 on back page) is an economical equipment choice for a variety of parts, but particularly rectangular parts. If a fabricator makes any type of boxes on a regular basis, this machine does the job quickly and efficiently.

But that doesn't mean other parts can't be made as well. Parts with two or three straight edges are a suitable fit for the right-angle shear. The machine can deliver finished parts with scrap separated. Again, as with the punch/laser combination, the goal is for parts to move from this machine to final production stages without the need for secondary operations.

When the shear is used to cut external contours, tool marks on parts are minimized. The use of the shear also helps to minimize wear on the tooling.

The punching capabilities of the machine mimic those of the standalone punch press. The machine can be operated as just a shear as well. Blanks that are square to within 0.004 in. can be product quickly.

Laser Next – The New 3D Laser System for Automotive Production



Laser Next is the fastest 3D fiber laser machine in the world. Designed for intensive cutting of hot-formed parts for the automotive industry, the new Laser Next, meets the three major automotive customers' demands: increased productivity; reduced equipment footprint; and lower maintenance downtime and non-productive times.



Automotive part manufacturers need highly-specialized products for the cutting of sheet metal parts, capable of answering to all their specific requirements.

Thanks to a deep and unique experience of over 35 years in this field and to a continuous dialogue with customers and partners operating in the car industry, Prima Power has designed the new 3D laser machine for automotive production: Laser Next.

In developing Laser Next, Prima Power has focused on the achievement of the following main benefits for the user:

1. Maximizing throughput thanks to a dramatic reduction of cycle times. During the last 10 years, the performance of Prima Power 3D laser machines for automotive applications has been growing steadily. With Laser Next, a fundamental step forward was made: productivity on a typical benchmark component (B-pillar) was raised by 25%. In other words, four Laser Next systems produce as much as five machines of the previous model.

At the base of this result, there is the best dynamic performance on the market for a 3D laser machine (208 m/min trajectory speed and 2.1 g acceleration), granted by the use of highly innovative solutions and materials for kinematics and machine structure such as, direct motors and transducers for main axes and focusing head, and machine frame in synthetic granite with optimized shape.

2. Space-efficient layout both for stand-alone and multi-machine configuration. Space is money, and a well-conceived layout helps save square meters and optimizes plant logistics.

The compactness of the installation further improves installing more machines, since you can have up to three units one next to the other connected to the same magnetic scrap conveyor, with no need of excavation works. Given the same area, in fact, it is possible to install more machines (e.g. four Laser Next instead of three units of the previous model). Considering the performance of Laser Next, the productivity per square meter ratio is simply astonishing.

3. Improved Overall Equipment Efficiency (OEE). For Laser Next, Prima Power capitalized on its know-how of hundreds of installations for the 24/7 manufacturing of High Strength Steel components, widely used in car production.

Every single detail was studied and developed to maximize machine uptime. Maintenance was also lowered and simplified to reduce non-productive times and the need of specialized resources dedicated to these activities.



Laser Next has a working range of 3,050 x 1,530 x 612 mm and is equipped with 3 kW or 4 kW high brilliance fiber laser. Its compact focusing head, fully sealed for best protection, features direct drive motors, double protection SIPS, fully-metallic sensor, and Focal Position Control.

The high-precision and dynamic turntable with servo motor and absolute encoder is designed to ensure the highest reliability, safety and ergonomics. Thanks to reduced blocking times, the distance between table and light curtains is very short, allowing faster and more comfortable loading/unloading operations in full safety.

Automation – A Game Changer for Italian Manufacturer

By Vittorio Pesce

To better understand the growing importance of laser cutting automation systems, we recently visited MAI S.r.l. (Salvirola, in the province of Cremona). This company has 17 employees and has been active in the field of sheet metal processing since 1979.

According to Andrea Iacomelli, sales manager, MAI is multi-faceted and is directed mainly to the sectors of electrical distribution, professional cleaning machines, vending machines, machines for the textile industry, domestic and industrial heating, etc. Since 2002, the company has achieved a new level in its production process by introducing different in-house processing technologies over the years, such as robotic press-bending, punching combined with shearing, and both CO2 and fiber laser cutting capability. "Today, our philosophy is to manage our customers' entire order, starting from the product engineering to the delivery, including the welding, painting, assembly and packaging," explains Iacomelli.

"We were initially skeptical about the use of laser fiber, but we immediately changed our minds, because it is a very reliable, fast, easy to use, and above all, very versatile machine."

The company's strength is the high level of automation achieved by highly sophisticated equipment and software, which make it possible to meet the various customer requirements in a short time. "We seek to build long-term relationships with customers with large volumes of production on long-range, even if the individual batches are very fragmented and typically consisting of just 50-100-150 pieces. It is the level of automation that allows us to change the type of piece to produce very frequently and to be competitive in the production of parts in small quantities," says Iacomelli.

The Right Choice

A collaboration that began in 2005 between MAI and Prima Power was essential in achieving a high level of modernization and innovation despite the small business size.

"In 2014 we decided to invest in a new laser cutting machine," recounts Iacomelli. "After a period of research and review with the



Detail of a piece machining produced by M.A.I. and manufactured with Platino Fiber of Prima Power.

Piece processed M.A.I. with the Platino Fiber of Prima Power.



Cristiano Porrati, South Europe Sales Manager of Prima Power (left) shakes hands with Andrea Iacomelli, sales manager of M.A.I. srl.

Prima Power technicians, we chose the 2D PLATINO® Fiber machine with 4 kW source. We were initially skeptical about the use of laser fiber, but we immediately changed our minds, because it is a very reliable, fast, easy to use, and above all, very versatile machine."

The PLATINO® fiber laser has allowed the company to cut any type of material, such as iron, steel, stainless steel, Aluzinc, aluminium etc., and to cover the full range of MAI's production up to 4 mm. "We have added a loading/unloading system and a sorting and automatic stacking system, called LST in order to ensure versatile and fully automated production," says Iacomelli.

The Versatile and Efficient Fiber

The Platino fiber's small wavelengths cut a wide range of materials, even those highly reflective materials such as aluminium alloys, copper, brass, etc. There are many benefits of using this machine, including very low energy consumption, high beam quality, absence of "laser gas", low maintenance, compactness and ease of use.

According to Cristiano Porrati, Prima Power's Vice Chairman South Europe, Sub-Region Manager, "The latest generation of Prima Power's numeric control is intuitive and functional, and provides high computing power and advanced algorithms for the optimal management of cutting trajectories."

The laser head is equipped with a single focusing lens adapted to any type of cut. This makes it possible to change the production without interruptions and loss of time.

Guaranteed and "Organized" Stacking

The LST is Prima Power's innovative automatic stacking system that can be matched to the Zaphiro® and PLATINO® laser machines. The LST avoids the manual separation of finished parts from the sheet metal skeleton, thereby reducing human intervention, increasing the finished product quality and expanding the productivity level even in unmanned operation.

This is achieved by means of a sophisticated robot which collects the pieces one by one directly from the cutting head and stacks them accurately on tables, or on trolleys, or deposits them in the dedicated boxes. The LST is a radically different solution, available in both short (PS) and long (PL) version to meet specific process and layout needs. It collects and stacks each piece according to programmed coordinates. This allows the possibility to freely arrange the stacks of material according to the production needs. The automatic stacking system is associated with NC Express, the CAD/CAM software for the automatic programming of laser cutting and pick-up and stacking functions of the LST system, by Tulus® graphical user interface with icons.



Laser head of Platino Fiber in a cutting operation.



System with Platino Fiber and Compact Server for handling sheets.

These advantages may allow the company to acquire new contracts, expand the market and increase the volume of work. Furthermore, since the unloading, scrap separation and piece stacking are managed by the LST system automatically, today workers that were once responsible for these activities may be reassigned to more productive operations. "It is a huge savings, and therefore a further reduction in our cost per piece," adds Iacomelli. "The 2D PLATINO® fiber laser with LST automatic piece detachment, sorting and stacking system turned us into a versatile, lean, and advanced company in the field of automated flexible production. More simply, it allows us to offer the market high-quality products with very competitive costs."

Results Above Expectations

The system, consisting of the laser fiber 2D PLATINO® and the Prima Power LST automatic sorting and stacking system, has been operating at the modern plant in Salvirola since January 2015. After a few months of operation, the company managers were well pleased with the system's performance. "The automatic stacking system was already known to us, and we were sure of its quality," explains Iacomelli. "As for the fiber cut, my initial concerns have been allayed. I did not think this technology would prove to be so efficient and reliable, as well as fast and precise. In fact, compared to the previous generation machine with CO2 source, the fiber has allowed us to not only reduce energy consumption, but also to cut production times in half."



Platino Fiber with LST.

"The 2D PLATINO® fiber laser with LST automatic piece detachment, sorting and stacking system turned us into a versatile, lean, and advanced company in the field of automated flexible production. More simply, it allows us to offer the market high-quality products with very competitive costs."



Compact Server for loading and unloading blanks and processed sheets.

Future Growth

"We have very clear ideas," concludes Iacomelli. "Our goal is to build a cutting, punching and shearing production unit with automatic warehouse, in order to bring the production processes to an even higher level of flexible automation. Ours is a company that is still operating on a little more

"I did not think this technology would prove to be so efficient and reliable, as well as fast and precise. In fact, compared to the previous generation machine with CO2 source, the fiber has allowed us to not only reduce energy consumption, but also to cut production times in half."

than regional level, but we believe that the potential of the company is such that we can greatly enlarge the market area. Soon we will try to attack a little more of the domestic market, but the most ambitious goal for the next two-year period is to internationalize the company, looking for customers across the border."

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Flexible Automation in Sheet Metal Processing

By Janne Mäkelä, Product Manager, The System, Prima Power



Prima Power has extensive experience in different technologies (punching, right-angle shearing, laser cutting, bending, etc.) and manufacturing lines in which sheet metal processing adapts to changing production demands in a fast and flexible manner.

Ford is a household name in the history of industrial automation. While Henry Ford did not invent the assembly line, he started using it on a large scale in 1913. The word *automation* was introduced to the English language in 1948, when it was coined by one of Ford's executives, Delmar S. Harder.

Since then, flexible automation solutions have been developed to complement rigid automation in sheet metal processing. The first significant steps were taken by automating individual machines by equipping machines with automatic tool change.

An essential development has been the automating of material flow by moving from individual machines to cell level by integrating work stages. Punching and shearing or punching and laser cutting cells are good examples. Naturally, the automation of raw material storage and material handling play a key role.

Flexibly automated sheet metal processing is inherently LEAN, which is revealed by the list of eliminated or reduced wastes, such as transportation, inventory, motion, wait time, overproduction, over-processing, and defects.

Flexible automation allows meaningful job profiles and, thus, helps create a healthier work community. One incentive is corporate image. For example, a large part of the world's sheet metal components are produced by subcontractors. Production itself is their product, and, therefore, the choice of production methods is significant for the company's image.

Flexible Automation in Manufacturing Lines

Prima Power has extensive experience in different technologies (punching, right-angle shearing, laser cutting, bending, etc.) and manufacturing lines in which sheet metal processing adapts to changing production demands in a fast and flexible manner.

At its best, an automatic manufacturing line is agile in fast production changes and can function on a "one-piece flow" principle. It is important to ensure fast and flexible availability of material, correct processing technologies, and sufficient tool capacity for manufacturing different components to avoid downtimes caused by tooling set-up.

The main principle of a flexible manufacturing line is to avoid manufacturing stages that do not add value to the product. Functional manufacturing may contain several of these:

- transferring a sheet stack to the warehouse and storing it
- transferring the required sheets to the manufacturing cell
- manufacturing a batch on a punching machine
- transferring the batch for bending
- bending
- transferring the bent pieces to the warehouse
- picking for assembly

In a sheet metal manufacturing line, most of the above-mentioned manufacturing stages can be eliminated, and, thus, it is possible to concentrate on stages that add value to the product. This means considerable savings in the employees' working time, and production management becomes a single step.

In functional production, batch sizes vary according to the requirements of manufacturing execution and efficiency. Correspondingly, this binds more assets to intermediate buffers and storage of semi-finished products.

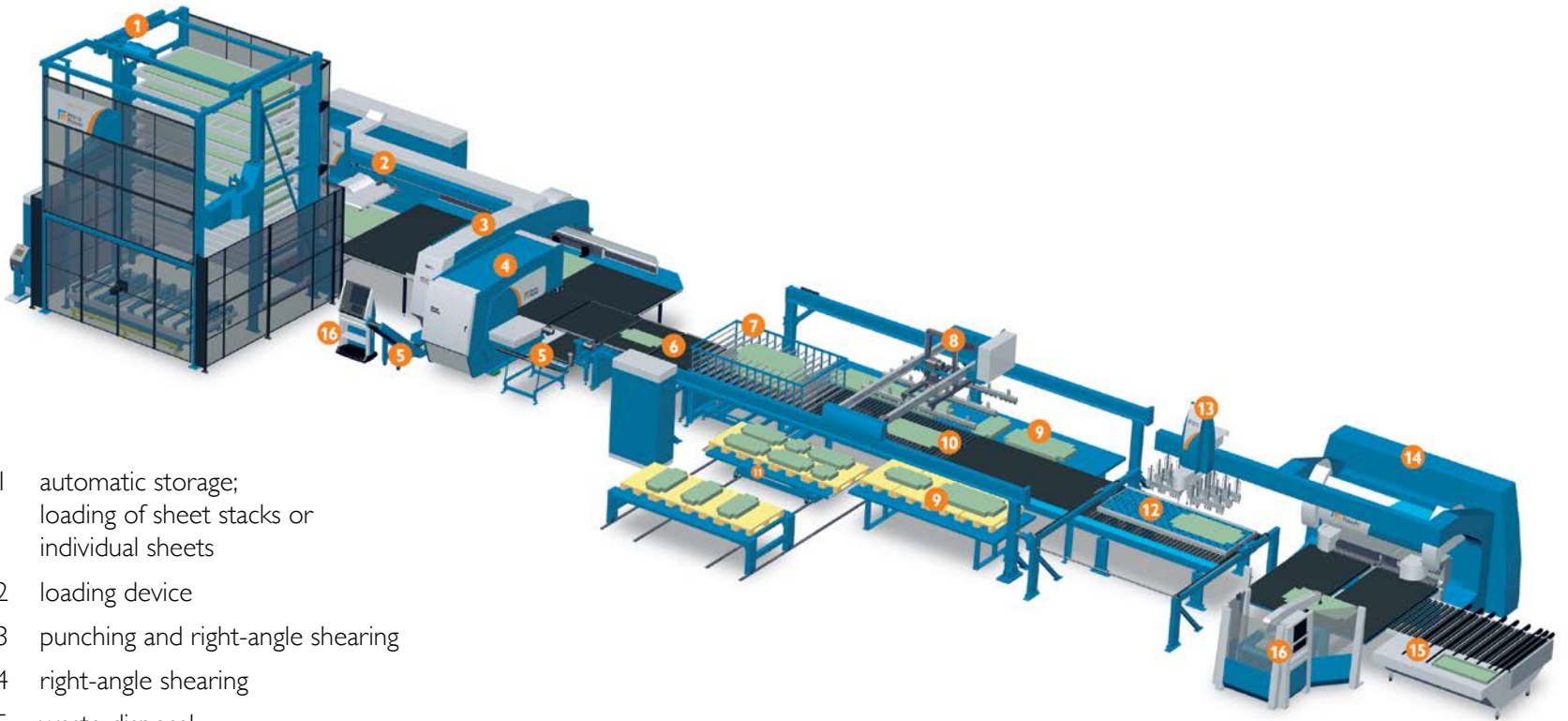
Such batch production is also possible with a flexible manufacturing line, but contemporary manufacturing execution software enables efficient production according to needs, whether by applying pull-type manufacturing for the assembly or manufacturing the parts of a single product all at once. In both cases, tied-up capital remains small and intermediate buffers of half-finished products are practically nonexistent.

PSBB Line

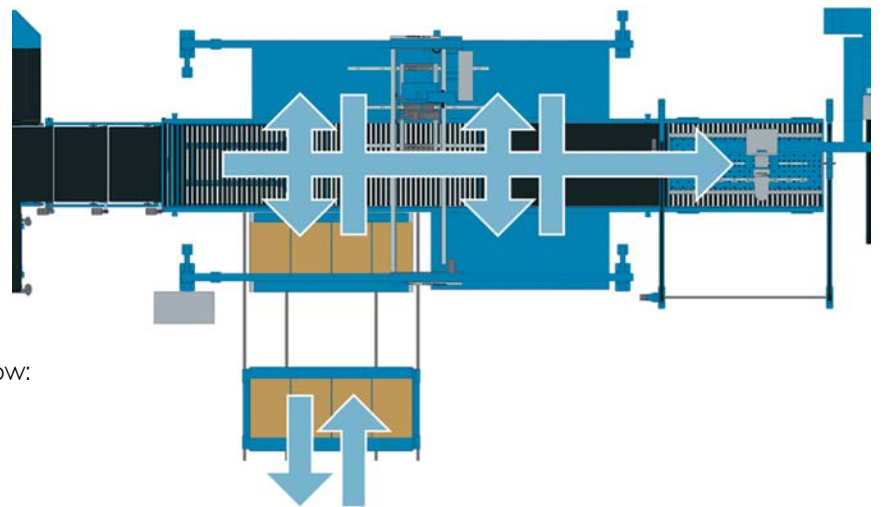
The Prima Power PSBB line integrates punching, shearing, buffering, and bending. The key benefits include one-piece flow, fast availability and changing of material, and the possibility of unmanned use. Pieces can be brought from outside sources to the production flow, and all material transfers are automatic.

Software

One of the cornerstones of automating entire manufacturing lines and managing them is a manufacturing execution system with which production can be run rationally from the order to a finished product. New-generation intelligent software solutions can do this, and they are very straightforward to use in relation to their performance.



- 1 automatic storage;
loading of sheet stacks or
individual sheets
- 2 loading device
- 3 punching and right-angle shearing
- 4 right-angle shearing
- 5 waste disposal
- 6 sorting of finished pieces
- 7 buffering
- 8 loading and stacking robot
- 9 buffering of bent pieces
- 10 positioning conveyor
- 11 loading and unloading wagon
- 12 turning device
- 13 loading device of the automatic bending cell
- 14 bending cell
- 15 unloading
- 16 user interface



Material Flow as Required

There are several interchangeable ways to arrange the material flow:

- straight from punching and right-angle shearing to bending
- buffering on the whole stacking area
- simultaneous stacking on the tables/wagons and bringing the parts to bending
- unmanned stacking in the whole stacking area

Shear Genius Cells Are the Recipe for Higher Productivity at Imperial Cooking Equipment

Since its inception in 1957, Imperial Commercial Cooking Equipment, Corona, CA, has remained a family-owned company whose mission is to be the preferred global supplier of high-quality, top-value cooking equipment to the foodservice industry.

Imperial utilizes highly-skilled employees combined with innovative manufacturing processes. Its customers include everything from major restaurant and grocery store chains to small family restaurants. Today, the company has evolved into a major player in the food service equipment industry with a 100,000-square-foot facility. "We either introduce a new product or update an existing product every year," explains Matt Wise, general manager.

Imperial also continually invests in state-of-the-art technology and machinery as part of the commitment to future growth. In the sheet metal fabrication area, the company has had a long and successful history with the Prima Power Shear Genius integrated punch/shear cell. "We purchased the first two Shear Genius cells in 1996," says Wise. "These hydraulic models served us well until we replaced them with the newest generation of servo-electric Shear Genius models in 2013 and 2014."



Since its inception in 1957, Imperial Commercial Cooking Equipment, Corona, CA, has remained a family-owned company whose mission is to be the preferred global supplier of high-quality, top-value cooking equipment to the foodservice industry. Imperial's customers include everything from major restaurant and grocery store chains to small family restaurants.

Servo-Electric Shear Genius

With the Shear Genius concept, the objective is to provide a machine capable of transforming a full-size sheet into finished parts. These parts can be moved to the final production stages for immediate integration directly into the final product assembly.

The heart of the Shear Genius SGe is an updated servo-electric 30-metric ton punching machine with 1,000 hpm stroke speed, 250 rpm index speed and 150 m/min sheet positioning speed. The right-angle shear has a servo-electric actuation system, which makes shear movement both fast and fully CNC controlled for optimum productivity. Material thickness in shearing can be up to 5 mm (Al), 4 mm (mild steel) and 3 mm (stainless steel). Automatic loading has been integrated, and both part removal and part sorting are programmable and automatic.



Matt Wise, general manager, has a long and successful history with the Prima Power Shear Genius integrated punch/shear cell. He purchased the first two Shear Genius cells in 1996, and replaced them with the newest generation of servo-electric Shear Genius models in 2013 and 2014.

The SGe is able to perform the most demanding jobs with minimal set-up times and "lights out" unmanned operations. Shear Genius increases material productivity through efficient and versatile nesting programs. As loading, punching, forming & upforming, unloading, sorting, and stacking become automated, the result is a finished part with a dramatic reduction in scrap and manual labor while increasing productivity.

The level of automation can be customized through Prima Power's flexible modular solutions for raw material storage & management, loading, unloading, sorting, and stacking. These features can be added later as budget allows and production demands increase or change. The SGe ease of operation does not compromise the cell's per-minute part production, flexibility, or ability to fabricate complex parts. On average, compared with a stand-alone turret punch press, the SGe reduces total manufacturing time by 60%.

"Our older Shear Genius cells were the hydraulic design from the 1990s and were really good," explains Wise.

"However, the new servo-electric models are faster, require less maintenance, provide longer tool and shear blade life, and are much easier to program. We used to run the old machines two shifts. Today, we are running all production on the two servo-electric Shear

"The new SGe's have helped us double our productivity. We can go from sheet to part without re-clamping. Unlike their competitors, Shear Genius punching and shearing utilize the same clamp...so production is continuous. Another positive benefit is that we have gone from a 100 amp circuit to a 50 amp circuit for the machines, which translates into an incredible power savings."

Genius cells in just one shift. The new SGe have helped us double our productivity. We can go from sheet to part without re-clamping. Unlike their competitors, Shear Genius punching and shearing utilize the same clamp...so production is continuous. Another positive benefit is that we have gone from a 100 amp circuit to a 50 amp circuit for the machines, which translates into an incredible power savings."

Other Shear Genius features and benefits include:

Tool Holders – Prima Power incorporates an individual tool holder concept that allows customers to design their own turret layouts. Unlike other designs, specific tool stations are not machined into the turret. Prima Power offers the only flexible selection of tool holders in the industry. Any tool from Prima Power's tooling partners can be installed in a Prima Power turret. Up to 10/15/16 or 24 auto-index, forming, or Multi-Tool® stations may be installed in a Prima Power turret.



As loading, punching, forming & upforming, unloading, sorting, and stacking become automated, the result is a finished part with a dramatic reduction in scrap and manual labor while increasing productivity.

“The SGe cells have made a huge difference in fit and finish on our production line. They are excellent at holding placement and consistency which allows us to tighten up our tolerances so that we can make holes instead of slots. This makes assembly of our products so much faster and easier. Hole alignment is always right on the money.”

Auto-Index – Prima Power's unique auto-index system precisely rotates the punch and die in their tool holders. Rotation in .001 degree programmable increments gives the machine the ability to rotate beyond 360 degrees, thus allowing the system to automatically select the shortest path to rotate to a programmed angle input into the NC part program with simplicity, speed, and reliability, and no tonnage constraint. Imperial has six auto-index stations.



With the Shear Genius concept, the objective is to provide a machine capable of transforming a full-size sheet into finished parts. These parts can be moved to the final production stages for immediate integration directly into the final product assembly.



Multi-Tool® – Prima Power's Multi-Tool stations increase the number of tools available in a turret, thus reducing setup and increasing productivity. The Multi-Tool system allows multiple tools to be put in one station. Prima Power's Multi-Tool and the drop-in and indexable Multi-Tools from Prima Power's tooling partners offers 6, 8, 10, or 24 different punch/die combinations in only one station – a turret within a turret. “We

have 120 tools in our turret thanks to our three Multi-Tool stations – an 8, 10, and 24,” says Wise.

Upward Forming System – Prima Power's upward forming option provides more accurate forming and greater forming heights up to 16 mm (.63”). 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. “We use our upform station for producing louvers, lance, and forms on the new SGe cells,” adds Wise.

Brush Tables – The brush tables are designed for lower noise, increased sheet support, and elimination of the risk of scratches. Imperial utilizes carbon steel on all interior parts and stainless steel on all exterior parts. The company processes about 6,000 tons of stainless steel per year, making it the largest stainless steel user in Southern California. “With the amount of stainless steel that we run, the new brush tables are great because we don't want to have marks on the material.”

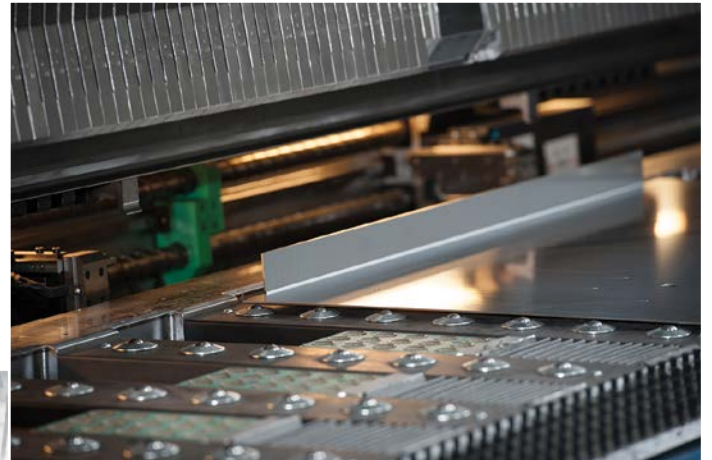
Faster, More Accurate Assembly

“The SGe cells have made a huge difference in fit and finish on our production line,” concludes Wise. “They are excellent at holding placement and consistency which allows us to tighten up our tolerances so that we can make holes instead of slots. This makes assembly of our products so much faster and easier. Hole alignment is always right on the money.”

Flexible FastBend Increases Production in the *Land Down Under*



Its technical expertise in advanced laser cutting and automated folding allows the Bertazzo team to deliver highly-accurate, cost-efficient solutions for any project specification. By maintaining a strong focus on customer satisfaction and continuously adding value, Bertazzo has established long-lasting relationships with its clients, including blue-chip companies such as Mars, Vita-Soy, National Foods, Ingham's, Federation Centres, Lion, AGL, Komastu, CSE Uniserve and Wilson Transformers.



The FastBend eliminates the cost of manual tool change with its automatic tool changing, typically taking less than 15 seconds, depending on the overall tool change required. Additionally, the system required only one operator which provided the added benefit of eliminating risk of injury.

Wodonga-based Bertazzo Engineered needed an efficient machine to help the company increase production of folded parts for its customers. The solution – a Prima Power FastBend supplied by IMTS Machinery – has surpassed all expectations.



Nevertheless, Bertazzo and his wife Trudie are always on the lookout for opportunities to improve processes, enhance efficiency, and provide a safe work environment for their staff. They found that one of the biggest obstacles impeding the company's production levels was in the operation of its two standard press brakes, which

Established in 1996, Bertazzo Engineered has forged a strong reputation in the Albury & Wodonga area of Australia, on the border between Victoria and New South Wales (NSW), by delivering high-quality component fabrication and installation services. After almost two decades in operation, the company remains a family-owned business, employing approximately 30 people at its Wodonga facility.

“Once the FastBend was in operation, Bertazzo capitalized on its immediate benefits by reducing cycle times for some parts from more than 20 minutes to less than one minute.”

“Basically, we're a complete one-stop-shop,” says owner and managing director Raymond Bertazzo. “From 3D modeling with AutoCad Inventor right down to fabricating and dispatching – we build, we cut, we fold, we weld, we blast, we powder coat, we assemble, and we deliver customer satisfaction. The company concentrates on trying to offer clients improvements and cost savings to their products using the latest technology that's available.”

were operating 8-10 hours per day, as well as creating a demand on personnel requirements.

“The press brake area was always a bottleneck to that process, in particular for the larger panels we do – at one stage we had lost a contract for some higher-volume work,” explains Bertazzo. “Not only was it slow in the traditional sense of using a CNC brake press, but it was also hard work on the guys themselves. We might be doing batches of 40, and each panel weighs between 40 and 60 kg.”

Having conducted his own research into the various solutions available on the market, Bertazzo turned to IMTS Machinery for assistance. After initial investigations by the specialist sales team at IMTS Machinery, all requirements clearly pointed to the FastBend – a highly flexible, efficient, productive and user-friendly servo-electric bending solution from Prima Power.

The FastBend is designed to serve as a productive step from press brakes towards fully-automatic bending. The machines are prized by customers in a wide array of sectors, ranging from automotive manufacturing to producers of office furniture, air-conditioning systems,

electrical cabinets and food display units. Bertazzo then visited Prima Power's headquarters and manufacturing facility in Italy to find out more about the machine first-hand.

"They made me feel like family," says Bertazzo. "We sent our own people over, not only to learn how to program and operate the machine, but to sit down with their design team to see what new things we could actually do with it, rather than just doing the same thing with AU\$1m worth of machinery. It really suited our purpose."

IMTS also identified a significant time-consumer in Bertazzo's production cycle with the manual tool-changing of the press brake and the handling of large parts. This presented several occupational health and safety (OHS) issues associated with folding large parts on a press brake. Most production runs required two operators, multiple manual tool changes, and an overhead crane to complete the part. The FastBend eliminated this costly obstacle with its automatic tool changing, typically taking less than 15 seconds (depending on the overall tool change required). Additionally, the system required only one operator which provided the added benefit of eliminating risk of injury.

"The Prima people and IMTS were fantastic. If the guys had a problem, we could send an email or ring them and they could sort it out. It was a very good experience, I can assure you!"

Once the FastBend was in operation, Bertazzo capitalized on its immediate benefits by reducing cycle times for some parts from more than 20 minutes to less than one minute. As the FastBend is completely servo-electric, power consumption dropped by 65% and the machine provided a greater degree of precision with each axis programmable to 0.01 mm. In addition, there was less need for maintenance and the stresses on the machine are reduced due to lower levels of heat from hydraulic pumps. The machine's compact physical footprint means the overall impact on the manufacturing environment is reduced and noise levels are significantly lower.

"It's not only to increase our productivity and get costings down to make us more competitive," adds Bertazzo. "It's also so we're not flogging the hell out of our guys. For example, we had 187 panels cut on a lights-out arrangement on the laser the other night, and one guy folded it up in 5.5 hours. It used to be at least a week's worth of work for two guys."

A huge benefit lies in the maximum bending height with an increase of 35 mm over standard machines – the FastBend has a maximum bending height of 200 mm, while standard machines are restricted to 165 mm. The machine can also be put into a *press brake* mode, which allows the folding of thin parts. This is achieved by using the ASP blades as the back gauges and avoiding the use of the suction cups.



The FastBend is completely servo-electric, dropping power consumption by 65%, while the machine provides a greater degree of precision with each axis programmable to 0.01 mm. In addition, there was less need for maintenance, and the stresses on the machine are reduced due to lower levels of heat from hydraulic pumps. The machine's compact physical footprint means the overall impact on the manufacturing environment is reduced and noise levels significantly lowered.

The system offers greater flexibility by not requiring automation at the start, which means it is possible to fold abnormal shapes. With the standard automation, Bertazzo could only fold rectangular or square-shaped parts. With the Prima Power FastBend, the company is now able to fold parts with angled sides. It also offers the possibility of adding a robotised system for automation in the future. The system's modular design allows for the growth of the machine as the business expands, a unique feature of the Prima Power product line that provides added flexibility for the end-user.

"It's amazing! It blows people away with what we can do with it. Our biggest problem now is keeping the work up to it. It's very hungry. Its capacity is phenomenal."

Overall, the Prima Power system offers significant ease of use compared with systems from other manufacturers. The team at Bertazzo were quick to mention that the FastBend has a very user-friendly system. Raymond and Trudie have been very happy with the level of service he received from IMTS Machinery and Prima Power and look forward to the possibility of more Prima Power machine tools to grow their business.

"They were great all the way through," he remarks. "The Prima people and IMTS were fantastic. If the guys had a problem, we could send an email or ring them and they could sort it out. It was a very good experience, I can assure you!"

Meanwhile, the FastBend continues to deliver a level of performance that impresses both the team at Bertazzo, and their customers.

"It's amazing!" concludes Bertazzo. "It blows people away with what we can do with it. Our biggest problem now is keeping the work up to it. It's very hungry. Its capacity is phenomenal."

www.imts.com.au
www.bertazzoeng.com.au

Carbon Fiber Machine Structure: Shear Brilliance!

By Marko Piirto, Manager R&D, Prima Power



More efficient use of the work area provides increased benefits, such as processing longer sheets with the same setting. The work area consists of a carbon-fiber coordinate table, nearly eight meters long, that positions the sheet.

Due to the constantly changing demands of customers, the pressure to manufacture short batches flexibly and quickly has grown. As a result, new innovative solutions are needed to improve productivity and flexibility.

The emergence of servo-electric technology has improved the speed and accuracy of machines, while dramatically reducing energy consumption and operation costs. Increased punching speeds, combined with higher axis accelerations and speeds, have increased the productivity of the Prima Power punch/shear units by approximately 25% every five years.



Carbon fiber is a material that enables a light but rigid structure for an axis movement that is longer than before.

Shear Brilliance

Finn-Power Oy introduced the first Shear Brilliance cell utilizing linear servo technology in 2000. Even at that time, the cell had an exceptional performance and technical design.

The latest Prima Power Shear Brilliance cell has become compact and easier to install, and its improved performance has made it significantly more productive. Other factors that have improved its productivity include automation in material handling, increased tool capacity, and the development of the control system and actuators. It is also possible to attach the cell to a manufacturing line.

Improved Performance with a Carbon-Fiber Structure

More efficient use of the work area provides increased benefits, such as processing longer sheets with the same setting. The work area consists of a carbon-fiber coordinate table, nearly eight meters long, that positions the sheet.

Carbon fiber is a material that enables a light but rigid structure for an axis movement that is longer than before. A combi machine, which is able to punch and shear long sheets in a combined working area without repositioning and has a larger working area and improved performance, brings benefits that are evident both in productivity and quality.

The capability to process sheets of more than 3 meters in length, a stroke mechanism of 1,300 strokes per minute, and a structural acceleration of 2 g are performances that cannot be achieved with steel structures in machines of this size category. The solution was carbon fiber that has been used in the manufacturing of the Shear Brilliance cell's coordinate table. With a carbon-fiber-reinforced composite structure, it was possible to reduce the mass of the coordinate table, which moves the sheet during processing, from a 700-kg steel structure to a 225-kg carbon-fiber structure. In other words, the weight of the structure was reduced by approximately 70%. This lightness has a significant effect on the performance, energy-efficiency, actuators, and surrounding structure of the machine.



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“Carbon fiber is replacing steel in mechanical engineering,” explains Tapani Huikuri, CEO of CSI-Composite Solutions and Innovations Oy. “Prima Power’s Shear Brilliance is an excellent example of this. A favorable price trend and the processing performance enable use of the material on a larger scale in machines when top performance and energy efficiency are needed.”

Energy Efficiency and Ergonomics

The lightness of the structure also reduces energy consumption, which is in line with the Prima Power Green Means® social responsibility philosophy. The power consumption is only 8 kW, the smallest in the world in this machine category.

With the latest programs, the cell is easy and logical to use. Programming is carried out easily with 3D CAD models.

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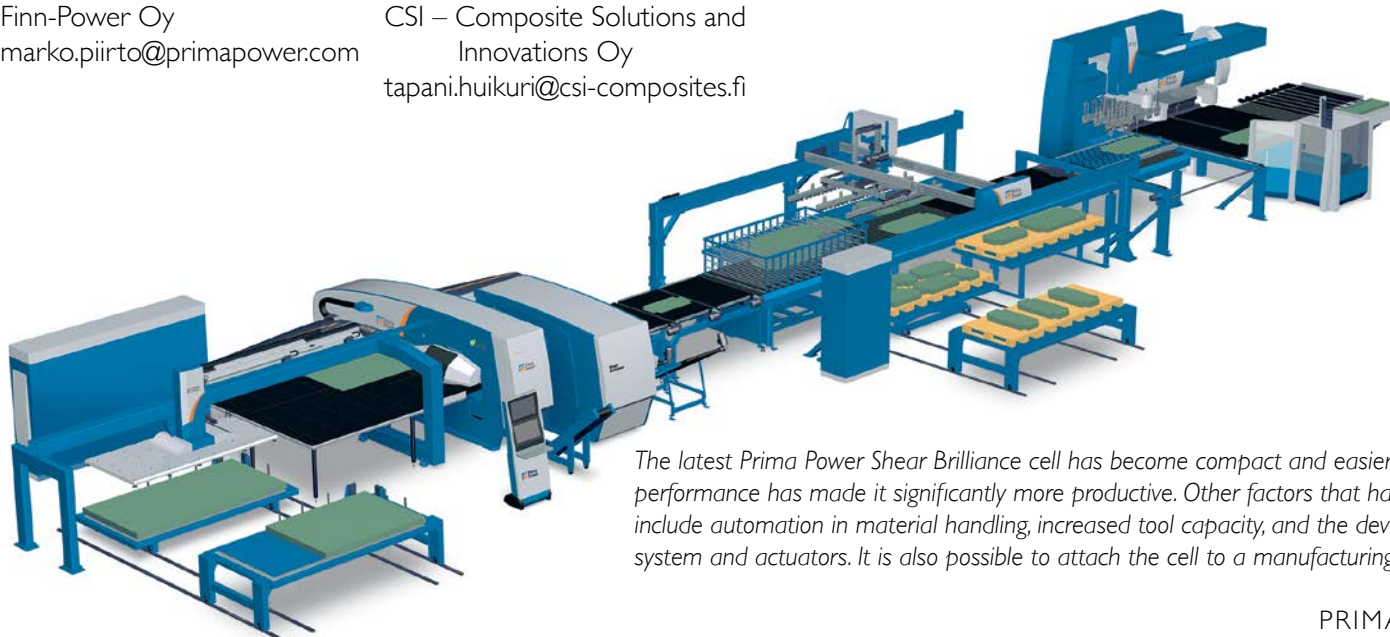
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Carbon fiber is a material manufactured from carbon fibers that have been bundled together. In everyday language, carbon fiber often refers to carbon-fiber-reinforced plastics, in other words composites, in which an epoxy resin matrix is reinforced with a carbon fiber mesh. The material is strong and light.

Carbon fibers are classified according to their tensile strength. Tensile strength measures the force that a fiber of a certain diameter can withstand without breaking. The SI unit for tensile strength is Pascal. Fibers with a tensile strength of less than 240 million kPa are classified as having a low tensile strength. Fibers having a tensile strength of 500-1,000 million kPa are classified as having a very high tensile strength. The tensile strength of steel is approximately 200 million kPa, which means that the strongest carbon fiber is five times stronger than steel.



With carbon fiber the weight of the structure was reduced by approximately 70%. This lightness has a significant effect on the performance, energy-efficiency, actuators, and surrounding structure of the machine.



The latest Prima Power Shear Brilliance cell has become compact and easier to install, and its improved performance has made it significantly more productive. Other factors that have improved its productivity include automation in material handling, increased tool capacity, and the development of the control system and actuators. It is also possible to attach the cell to a manufacturing line.

Finland Hosts Technology Tour and Manufacturing Days

For the third year in a row, Prima Power organized a well-attended open house event in Finland. The first week of June was chosen in order to showcase the Finnish summer at its best. Although the weather was chilly, the guests could still experience early summer Finnish nature and the midnight sun. The event consisted of two parts: a tour to four system customers in Southern Finland, followed by a visit to the Manufacturing Days open house at the Kauhava facilities.



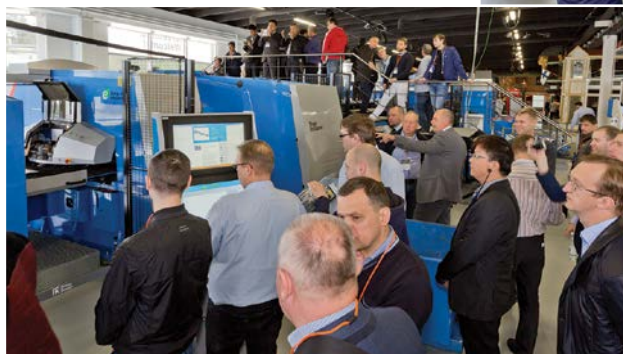
The fabrication solutions exhibited during the tour aroused considerable interest among the global group of participants.

Most guests had travelled to Finland from the Far East (China, Korea, Taiwan, Indonesia) or from across the Atlantic from both the US and Canada. In addition, Swedish, Estonian, Russian and Lithuanian customers represented the neighboring countries of Finland. Altogether, nearly 300 guests from 15 countries received detailed information on Prima Power products and fabrication solutions.

This event focused on systems and automation. There were stand-alone machines and cells on display, but the key role was given to two products of The System family, PSBB and LPBB manufacturing lines.

The PSBB integrates punching, shearing, buffering and bending; the LPBB features laser cutting instead of shearing.

At the Kauhava Technology & Training Center, the visitors could experience the manufacturing process of electric cabinets and small barbeques with the PSBB line and a press brake installed next to it. At the factory, the LPBB line, due to be delivered to an Estonian customer, was used to manufacture parts of a pizza oven which could be seen beside the machine.



"500th" Panel Bender Celebrated at Cologna Veneta Open House

On April 17 & 18, Prima Power opened the doors of its facility in Cologna Veneta (VR), Finn-Power Italia, to showcase the latest innovations in its wide product range and to celebrate the 500th panel bender manufactured in the plant.

The production facility in Cologna Veneta, with an area of 5000 m² and about 200 employees, is dedicated to the manufacturing of press brakes, panel benders, and automated bending cells. The facility also includes a Technology Center where all the technologies supplied by Prima Power plants are available, and where a team of expert and highly-qualified engineers are in charge of demonstrations and cycle-time studies, as well as consulting and training activities.



Visitors saw live demonstrations on a variety of equipment, including: a Shear Genius SGe6 integrated punch/shear with Combo and STS; a PunchBend line; a Platino 2.0 Fiber laser machine; a FastBend 6 panel bender; and an ePI 030 press brake.

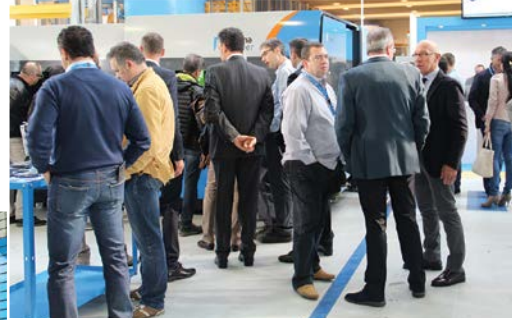
"All group technologies were well represented during the Open House," explains Claudio Banchi, Prima Power Executive VP Sales EMEA and South America. "I am particularly satisfied with this event. In a day and a half, we registered about 350 guests, with 15% being foreign visitors. This Tech Center, together with the Finnish facility located in Kauhava, are the most important in Europe for us. In this center, an average of 100 feasibility studies and demonstrations are prepared every year. This year, we started building a new Technology Center in Torino, which will complete the set of showrooms and technological support centers already in operation in Europe, the United States, and China. This demonstrates our commitment to continue to invest in order to improve our customers' experience."

This Open House was also the occasion to celebrate a special event for Prima Power: The delivery of the 500th panel bender manufactured in this plant to our customer Weidmüller Interface GmbH & Co. KG, an important German manufacturer in the field of power, signal, and

data for industrial applications. This "special edition" of the FastBend, with the 500 logo created for this occasion, will be utilized by the customer to manufacture electrical cabinets of various sizes.



"I am really proud of this result," continues Banchi. "Hundreds of customers around the world have chosen our panel benders to improve their production efficiency and the quality of their products. The delivery ceremony of our 500th panel bender represented a symbolic moment to thank this customer, and also all the users of our machines for their trust over the years, with the hope of sharing many other successes with them."



A Family Day was also organized for the plant employees and their families at the end of the event. "Our people are the basis of our success, and, therefore, we wanted to celebrate our success with them and their families," states Fabio Finozzi, Finn-Power Italia General Manager. "Every day, our people experience the challenges and the satisfactions of working in an innovative international group and contribute to our growth with their commitment, ideas, and skills."





Figure 4
Punch/Shear Combination

- Cost-effective Holmaking:** Yes
- Material Utilization:** Excellent for parts with at least one right angle
- Secondary Operations:** None
- Part Nesting:** Good
- Forming:** Upforming with indexing, good control, no marking
- Contouring:** By nibbling, wheel cutting, or special tooling
- Flexibility:** High, requires tooling
- Combined Operations:** Yes with multiple tooling options (tapping, marking, etc.)
- Tooling Compatibility:** Existing tooling
- Part Quality:** Good accuracy, no nibble marks on linear cuts with right-angle shear

Material and part handling can be fully automated, or a fabricator can elect to use trap doors and conveyors to assist with material removal and limit operator engagement. The machine's shear destroys skeletons in a quick and easy manner; operators won't have to wrestle with awkward sheet remnants.

Cost of Operation. These units show improved energy usage, as do other servo-powered devices. Being a punch, tooling is

necessary, and maintenance for that tooling is to be expected. The shear blade needs to be maintained as well.

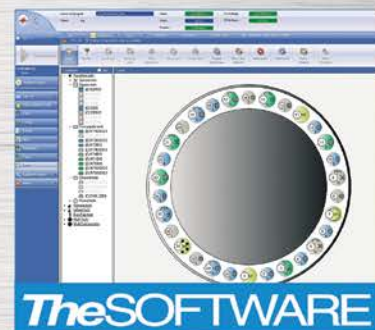
Fabricators find themselves in the midst of an age of rapid technology development. The equipment of yesterday may get the job done, but it's not doing it in the most efficient way. Change is inevitable, and that may ultimately require a change in fabricating technology as well in order to compete in the global marketplace.

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Prima Power offers the widest range of sheet metal fabrication equipment from stand-alone machines to full Flexible Manufacturing Systems.



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