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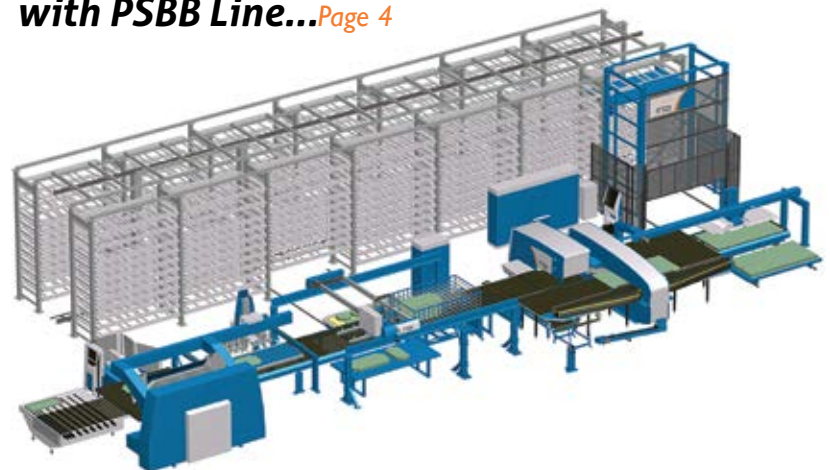


CUSTOMER PROFILES • NEW TECHNOLOGY • PRODUCTIVITY • FLEXIBILITY

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40 Years Of Prima Industrie – An Inspirational Story

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



2017 has been a special year for Prima Industrie: we have turned 40.

In 1977, a group of young and talented engineers led by Franco Sartorio founded the small company that then became Prima Industrie. Our President, Gianfranco Carbonato, was among the founders. I joined the group a couple of years later.

The Prima Industrie story is unique and inspirational. From the laboratory located in a farmhouse on the outskirts of Torino, the company started to invent and develop a multitude of innovative mechatronic products for other companies. The goal was to automate processes that were still manual and conventional. It was the start of the 3rd industrial revolution and we were its pioneers.

Since then, the company transformed itself from a small business into a world market leader, manufacturing cutting-edge laser and sheet metal working machinery, and one of the protagonists of the 4th industrial revolution.

But the history of Prima Industrie is not just about machines and technology; it is most of all the history of its people. Without the support of the diverse generations of people who have been working for our company over these 40 years, this incredible growth would have been impossible. Everyone has played a key role in the expansion and transformation of Prima Industrie. They are the sparks that have started and made this company great.

And Sparks is in fact the title of the book that tells this amazing story and was published to celebrate our 40th anniversary. *Sparks* is a narrative of the complex combination of people, ideas, motivations, and financial and professional opportunities and risks that are part of the birth and development of a corporation. The book provides a behind-the-scenes view of the impact such an undertaking can have on customers, employees, investors, and suppliers worldwide. But it is much



more than just a historical publication. It is an exploration of a journey that began 40 years ago and continues today.

We are also deeply grateful to our customers and stakeholders who have trusted us over these four decades. Their needs, challenges, and feedbacks have pushed us to improve and grow.

We are extremely proud of the results reached so far, but we are even more enthusiastic about the present and future of our group, and this issue of Power Line tells some of our latest accomplishments.

With the same passion, commitment, and innovative spirit we are moving to what's next for our group. Continue to stay with us and to be part of this exciting story!



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Timeline

25 March 1977

Establishment of Prima Progetti S.p.A.

1 July 1977

Prima Progetti S.p.A. starts doing business

30 October 1978

Establishment of Prima Electronics S.p.A.

29 November 1978

Takeover of Imperial RIV (subsequently Imperial Prima)

18 September 1980

Establishment of Prima Holding S.p.A.

7 April 1983

Prima Holding S.p.A. changed its business name to Prima Industrie S.p.A..

19 December 1983

Establishment of Sapri S.p.A. (54% Savio – 46% Prima Industrie (49%))

1 July 1985

Entry of Amada in Prima Industrie S.p.A. (49%)

30 October 1985

Merger by incorporation of Prima Progetti and Imperial Prima into Prima Industrie S.p.A.

26 July 1989

Prima Industrie and Amada 50/50 in Sapri

28 August 1989

Prima Industrie and Amada Metreks 50/50 in Prima Electronics

21 December 1989

Establishment of Prima Misura (50/50 with Elsag)

21 December 1990

Sale to Elsag

25 February 1992

Takeover of Laserwork

30 June 1993

Sale of the design business for Amada to Crea

18 April 1995

Prima Industrie buys back the share of Amada Metreks and regains 100% control over Prima Electronics

16 June 1995

Recapitalization of Prima Industrie: Amada leaves as a shareholder



29 February 1996

Sale of Sapri to ABB

31 July 1998

NASDAQ listing suspension

6 September 1999

Establishment of the 1st JV in Shenyang (China)

27 October 1999

Prima Industrie listing on the New Market

7 June 2000

Takeover of Convergent Energy (USA)

1 April 2001

Takeover of Laserdyne (USA)

11 February 2003

Announcement of the takeover bid on Prima Industrie

27 July 2003

Establishment of the 2nd JV in Shanghai (China)

25 May 2005

Takeover of Matra-Werke from Linde

2 July 2007

Takeover of Osai by Prima Electronics

4 February 2008

Takeover of Finn-Power Oy from EQT

4 February 2011

Creation of the Prima Power and Prima Electro brands and new graphics for the Prima Industrie brand

23 August 2013

Establishment of Prima Power Suzhou (China)

26 March 2015

Inauguration of the plant in Suzhou (China)

19 October 2015

Establishment of the Prima Power Diode Fab in partnership with Turin's Polytechnic

23 May 2016

Inauguration of HQTC in Collegno (Turin)



Elevator Company Reaches New Heights in Flexible Production with the PSBB Line

By Antonio Vendramini

This article was translated and reprinted from the November 2017 issue of Lamiera magazine.

The KONE Group has the objective of improving the flow of people inside buildings with smart solutions, security-conscious users, ecology, and energy savings. The KONE systems operate to make a more comfortable and reliable environment wherever a person lives and works.

Within this vast sector there is the chapter on the elevators, which the Group builds with different versions depending upon the type of environments. Within this chapter, the Pero plant produces doors and cabins, placing itself at the forefront in the Group for sheet-metal machining. Giuseppe Bilardello, managing director of KONE Industrial SpA explains: "Italian industry is recognized internationally for having great expertise in the field of metal working. As a result, it is natural for the KONE Group to invest in this factory for the production of cabins, elements of the elevators in direct contact with the end user, and therefore strategic for customer satisfaction. The Pero factory also produces part of the cabin doors and platforms, the remainder is made at our twin factory in Czech Republic."



"Prima Power was not simply a supplier, but a partner for us to grow together. We created a line that works continuously and automatically, without any external intervention, a component different from one another, 24 hours a day, seven days a week."

After this interesting overview, Bilardello specifically details the processing line ordered from Prima Power: "Prima Power was not simply a supplier, but a partner for us to grow together," says Bilardello. "We created a line that works continuously and automatically, without any external intervention, a component different from one another, 24 hours a day, seven days a week."

A Flexible Production Flow

"Previously, the sheet transfer happened through pallets and then

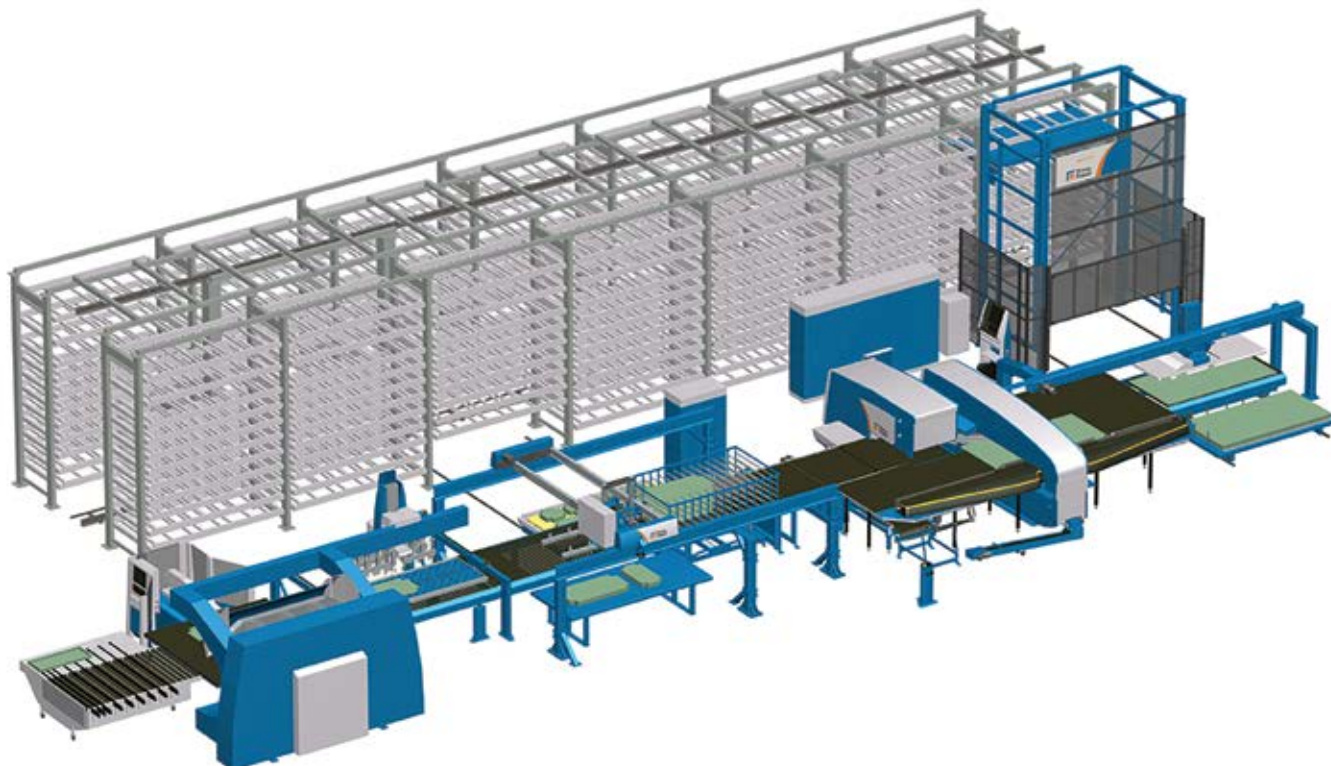


The maximum folding length of EBe5 is 2750 mm, while the minimum length between the folds is 350 mm. The folding force can reach up to a maximum of 41 tons, power that is varied and automatically set up by the CNC of the machine, depending on the type of material and the length of the piece to be folded.



the operating units ran many parts with a waste of time associated with changing material," explains KONE Eng. Pensa. "The new Prima Power PSBB line can be supplied with single sheets without wasting time in the set-up. Another important objective was to transfer the management of the workflow from the operator (as was previously the case) to the system, which must then automatically set, providing a centralized planning of orders to be processed on the system."

"Our finished product is assembled entirely at the end customer," adds Bilardello. "Each KONE production plant manufactures the module within its competence. For example, the cabins and doors are produced at Pero and then forwarded to one of our three distribution centers, where they are grouped with modules produced by partner suppliers. This consolidates all the necessary modules for a particular order."



“The metal sheets that we process on the line have a maximum size of 2650 x 1250 mm, in thicknesses currently ranging between 0.8 and 1.0 mm,” explains Pensa. “We utilize approximately 100 material codes that are grouped into classes that have similar characteristics.”



The Kone PSBB line works continuously and automatically, without any external intervention, 24 hours a day, seven days a week.

Line Macro Vision

According to Riccardo Pellegrini, Prima Power Italy sales manager: “The starting points that we had in July 2014 were precise and clear. Starting from an existing sheet metal material management warehouse allows access to single sheets that may be different from one another. This changes the management of the flow from the operator to the line control, and enhances high precision and repeatability. Our material management system reserves a block of the existing warehouse with 10 boxes, available for raw material. The warehouse stacker, in accordance with the programming sequence, feeds various selected



The PSBB line is a new FMS compact system created by Prima Power for full and controlled high-quality processing of metal sheets.

raw materials. The second step was to arrange selecting and transport of these sheets, which is accomplished with the use of our FLD (Fast Loading Device) that picks up the proper sheets. In this way, it resolved the issue of continuous operation of the line according to the logic of *one piece flow*.”

Further complicating the system is the fact that the pre-existing vertical warehouse has to feed even another line purchased by KONE earlier, and dedicated to the production of other components of the cabin. How did KONE simultaneously handle two different lines relating to the same material handling system? According to Pensa, “We have developed a special software for the management of the warehouse that allows each of the two lines to withdraw the materials required for each of the two lines, without any hindrance whatsoever, as demonstrated during the past 16 months of Prima Power line operation.”

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Elevator Company Reaches New Heights in Flexible Production with the PSBB Line

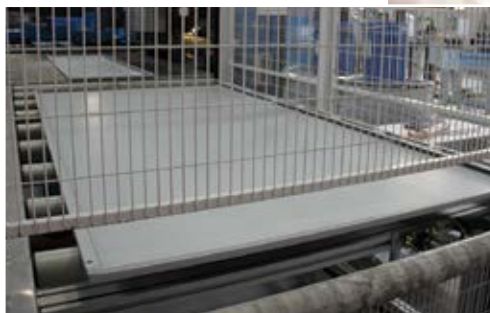
By Antonio Vendramini

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“This is a new FMS compact system created by Prima Power for full and controlled high quality processing of metal sheets.”

Each individual sheet taken from this FLD unit (developed for KONE, now a product in the Prima Power catalog) is placed by a portal structure with suction cups on a table which basically constitutes the beginning of the line. The same portal transport unit can bring extra sheets on this table, placed by a pallet on an adjacent table. These sheets can be inserted on a select basis by the manager of the line into the operation flow. At this point, after an initial phase of labelling with bar codes to identify the type of each piece, the metal sheets are entered by the same transport portal unit into the line itself. “Even this line, consisting of an ordered collection of operating machines, represents a solution of our range called PSBB (acronym from Punching, Shearing, Buffering, Bending) with reference to the operations that will be performed in succession on the sheets,” explains Pellegrini. “This is a new FMS compact system created by Prima Power for full and controlled high quality processing of metal sheets.”

The processing sequence starts with the punching phase, then the separation of components through an angular shear. The outgoing flow of parts is handled by a series of devices designed to maximize the system crossing line times, so that machines in sequence are prevented from operation stoppage in order to compensate different processing times. An important element is a buffer for temporary parking, called PSB, which organizes the output time of the cut component moving toward the programmed address. The next step is managed by a picking portal robot with three independent and programmable arms, the PSR, which continuously varies the grip configuration to provide for the placement of parts. Otherwise, the component can be sent directly to the folder; the EBe5 panel bender, first being zeroed on a transit conveyor and eventually flipped through the device BTD, if necessary, to reverse the folding side with respect to the punching one.



up to 1300 strokes per minute. The tower features 30 tool workstations, some rotating, others fixed, that with appropriate supports can collect over 500 tools. Given the broad scope (4070 x 1640 mm), the sheets by KONE are worked without needing to be repositioned. The angular shear built into the machine features the ACS (Automatic Clearance Setting) device, that allows automatic adjustment of the cutting conditions according to thickness differences and/or to the nature of the material. This is also an important element of the overall productivity of this unit. The average electricity consumption is about 8 kWh.



Kone's material management system reserves a block of the existing warehouse with 10 boxes, available for raw material.



The first unit of the line consists of the SBe6 punching-shearing machine. It is a completely servo-electric machine with sheet handling performed using linear motors that increase the speed of placement up to 210 m/min (part of the machine structure is made of composite material), greatly increasing productivity.

The Individual Units That Make Up The Line

Punching and Shearing Machine SBe6

The first unit of the line consists of the punching-shearing machine SBe6, better known as Shear Brilliance. “It is a completely servo-electric machine,” explains Pellegrini, “with sheet handling performed using linear motors that increase the speed of placement up to 210 m/min greatly increasing productivity.”

The punching power exerts a force of 35 tons, thus allowing even complex punches with a single stroke; despite this high pressure of the punching beam the speed is not compromised, being able to operate

EBe5

“To resolve the requests by KONE for high operational flexibility and high-quality of the fold, we installed our EBe5-3 panelling machine which has the precise control of its folding axes regardless of any change in thermal conditions,” concludes Pellegrini.

The maximum folding length of this unit is 2750 mm, while the minimum length between the folds is 350 mm, the folding force can reach up to a maximum of 41 tons, power that is varied and automatically set up by the CNC of the machine, depending on the type of material and the length of the piece to be folded. The average energy consumption of this machine is less than 14 kWh, saving over 60% compared to units featuring hydraulic solutions.

RV Industry Parts Supplier Finds Winning Combination with Prima Power

This year, North American RV shipments are expected to hit their highest level ever, according to the Recreation Vehicle Industry Association, marking the industry's eighth consecutive year of gains. Those shipments are accelerating, and should grow even more next year, the group said. Sales in the first quarter rose 11.7 percent from 2016.

Through hard work, great timing, smart fabrication equipment procurement, and a strong employee base, Rock Run Industries, LLC, Millersburg, IN, has been able to ride this strong RV wave to register some very impressive growth. Located near Elkhart, IN, known as the *RV Capital of the World*, the company was founded by Fritz Schlabach in 2007. Schlabach quit his full-time job in the mobile home industry and purchased an old punch press and other used equipment. Today, the company has grown to 45 employees housed in a 37,000-square-foot building for offices and fabrication and a small powder coating facility

that will soon be relocated to a 36,000-square-foot building. Since 2013, Rock Run Industries has doubled its sales.

"The RV industry is very demanding," explains Schlabach. "We are a high-mix, low-volume industry with short lead times, less than two weeks most of the time. In order to meet the JIT demands of our customers, we began searching for new equipment. We had an older punch press. In 2014, we saw the Prima Power E6x turret punch press run at the FABTECH Show in Atlanta, and made our first new equipment purchase from Prima Power that was installed in January, 2015."



Prima Power's Compact TowerServer allows easy loading/unloading for blanks and processed sheets. It has an elevator for loading and unloading the pallets on and off the tower, and features single sheet separating, control systems, and sheet reference.

E6x Turret Punch Press

With the E6x by Prima Power, modern servo-electric punching productivity is available in a flexible and affordable package. It has been designed to offer a versatile capacity, made easy to utilize. Prima Power's machine control and user interface software with touch screen panel ensure fast setup and convenient operation.

"We looked at other brands, but because of the excellent Prima Power service on the turret punch press, we selected them for the fiber laser and servo-electric press brake."

"We found we liked the servo-electric technology...and the Prima Power service department," says Schlabach. "And a year later, we were looking for a laser and a press brake. We looked at other brands, but



Rock Run Industries purchased the Prima Power Platino 2.0 fiber laser with a 10-shelf tower in the first quarter of 2016.

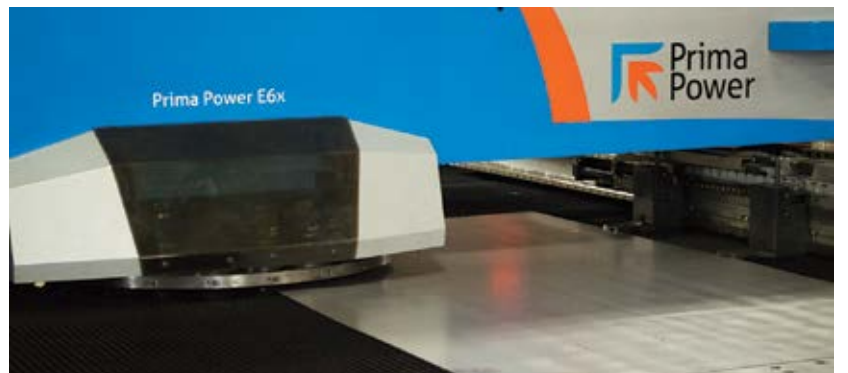
because of the excellent Prima Power service on the turret punch press, we selected them for the fiber laser and servo-electric press brake."

Platino 2.0 Fiber Laser & Compact Tower

Rock Run Industries purchased the Prima Power Platino 2.0 fiber laser with a 10-shelf tower, which was installed in March, 2016.

The Platino fiber laser cutting machine is the perfect balance of innovation and experience. It is the right choice for sheet metal manufacturers looking for a production tool which is:

- efficient, providing energy and maintenance savings
- productive, particularly on thin and medium-gauge sheets
- flexible, suitable for a wide range of materials, including highly-reflective metals
- reliable and capable of meeting any production need, with a variety of automation modules
- user-friendly, easy to install, use, and maintain



With the E6x by Prima Power, modern servo-electric punching productivity is available in a flexible and affordable package. It has been designed to offer versatile capacity made easy to utilize. Prima Power's machine control and user interface software with touch screen panel ensure fast set up and convenient operation.

Continued on page 8

RV Industry Parts Supplier Finds Winning Combination with Prima Power

Continued from page 7



BCe Smart is very flexible and is also ideal for producing small volumes, kits of components, and individual parts with high-quality bending and high repeatability.

The Platino fiber laser can be used to cut a wide range of materials. Fiber lasers are more effective than other laser sources for cutting highly-reflective materials (e.g. aluminum alloys, copper, brass). The Platino Fiber cuts various thicknesses, up to 20 mm of mild steel, with efficiency and quality. Productivity increases particularly with thin and medium-gauge sheet metal.

“The Platino fiber laser and tower has a small footprint that fits our shop. It has allowed us to bid jobs and be confident that we have the capacity to complete the job on time.”

Fiber Laser for New Product

Outdoor kitchen cabinetry is a relatively new product for Rock Run Industries that utilizes galvanized steel for the countertops and doors. “We are cutting a large amount of 16 gauge galvanized steel every week,” explains Schlabach. “We had the CO2 laser, but it didn’t do that good of a job on coated materials like galvanized. As a result, we were outsourcing all of this work. When we bought the Platino fiber laser, we brought that work back in-house.”

Flexible Automation

Prima Power’s Compact TowerServer allows easy loading/unloading for blanks and processed sheets. It has an elevator for loading and unloading the pallets on and off the tower, and features single sheet separating, control systems, and sheet reference.

The Platino Fiber is particularly suitable for lights-out operation, often performed in

unattended mode. It is a fully independent machine, with no need for manual intervention during machine operation. Once the production schedule is programmed, the Platino Fiber laser takes care of the necessary settings, tip replacement, sheet change and storage, etc.

“We bought a 10-shelf compact tower because we don’t have a lot of room in our shop and also wanted to do lights-out production,” says Schlabach. “The Platino fiber laser and tower has a small footprint that fits our shop. It has allowed us to bid jobs and be confident that we have the capacity to complete the job on time. If needed, we can run the unmanned extra shift on the laser without adding people.”

eP Servo-Electric Press Brake

The Prima Power eP servo-electric press brake was also installed at Rock Run Industries in 2016. The design of the Prima Power high-precision brake is based on the company’s extensive experience in press brakes and servo-electric machine tools in the metalworking industry. The eP servo-electric brake reduces the costs to form metal components by lowering operating costs, increasing productivity, and reducing setup time.

“The eP-1030 servo-electric press brake is very accurate. In fact, the repeatability is so great that the welders request any jobs in lighter gauges are run on the eP-1030.”



The eP servo-electric brake reduces the costs to form metal components by lowering operating costs, increasing productivity, and reducing setup time. Upper beam deflection under load is eliminated in the Prima Power eP model press brake while also eliminating the need for bed crowning. The closed frame eliminates side housing deflection as experienced with C-frame designs.



The BCe Smart's compact layout, low maintenance, and quick and easy installation make it a truly unique machine. The servo-electric actuators significantly reduce energy consumption and maintenance costs.

Upper beam deflection under load is eliminated in the Prima Power eP model press brake while also eliminating the need for bed crowning. The closed frame eliminates side housing deflection as experienced with C-frame designs. The servo electric drives of the eP model press brake evenly distribute the bending forces in the upper beam to provide improved bending accuracy, increased productivity, lower operating costs, high reliability, and fewer maintenance requirements.

"The eP-1030 servo-electric press brake is very accurate," says Schlabach. "In fact, the repeatability is so great that the welders request any jobs in lighter gauges are run on the ep-1030. We keep the Prima Power machines quite full of production...we don't have the luxury of being down a day or two."

Customer Satisfaction

Rock Run Industries currently does sub-contract work for over 150 different RV OEM plants. "Our customers will check on us from time to time," explains Schlabach. "They want to make sure that we have the modern equipment that will run every day. They will come to our plant and inspect. They are knowledgeable customers, and they have to be comfortable working with us on a just-in-time basis. The addition of the Prima Power equipment has been a big part of our success. It has allowed us to supply a high-quality part at a very competitive price that we can deliver to our customer on a JIT basis."

BCe Smart Panel Bender

The latest addition of Prima Power equipment to be installed at Rock Run Industries was the BCe Smart panel bender when it was delivered after FABTECH 2017. The machines of today must be increasingly smart and productive. Ease of use, ergonomics, flexibility, active safety, and reliability are the key requirements to face the new challenges that the market imposes. The BCe Smart 2220 is the new panel bending

machine by Prima Power which perfectly meets these requirements with simple but innovative and smart solutions.

"Again, we made the decision to purchase the BCe Smart based on the service we have received from Prima Power. It's the people at Prima Power that make the difference."

BCe Smart is very flexible and is also ideal for producing small volumes, kits of components, and individual parts with high-quality bending and high repeatability. The compact layout, low maintenance, and quick and easy installation make it a truly unique machine. The servo-electric actuators significantly reduce energy consumption and maintenance costs.

"We purchased the BCe Smart to run the galvanized product," says Schlabach. "There are many 6-foot long panels, that are 2-1/2 feet wide, and weigh approximately 40 lbs. When we make these on the press brake and put a flange on a 6-foot long part, the operator is lifting the part up past his head, and then flips the part. You can't do this type of work year after year and not create some type of physical problem. So instead of buying another press brake, we decided to go with the panel bender. It will be faster and a lot more ergonomic. And the BCe Smart can do bends that press brakes can't, such as radius bends, hems, etc. It will allow us to offer more options and versatility to our customers."

"Again, we made the decision to purchase the BCe Smart based on the service we have received from Prima Power," concludes Schlabach. "It's the people at Prima Power that make the difference."

A Successful "Factory Experience" at the Blechexpo

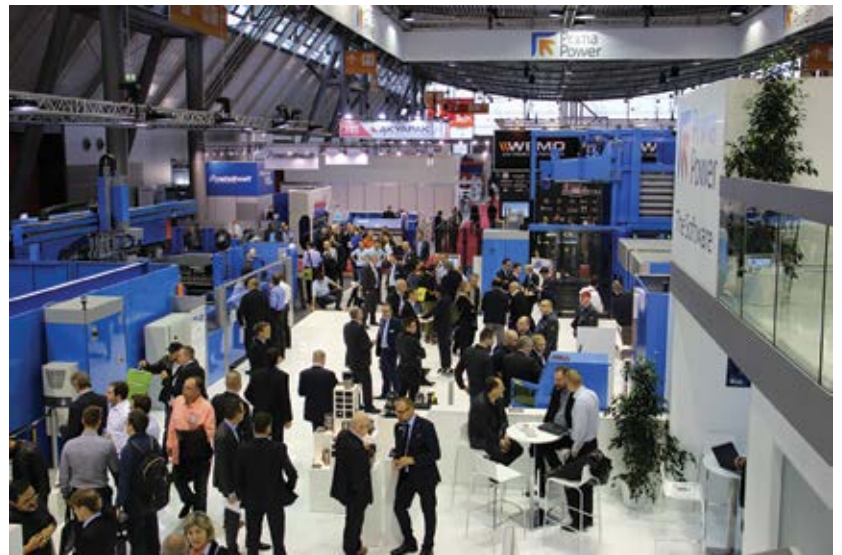
The exhibition of the year in the field of sheet metal processing for the European market was the 13th Blechexpo, held in Stuttgart from 7th to 11th November.

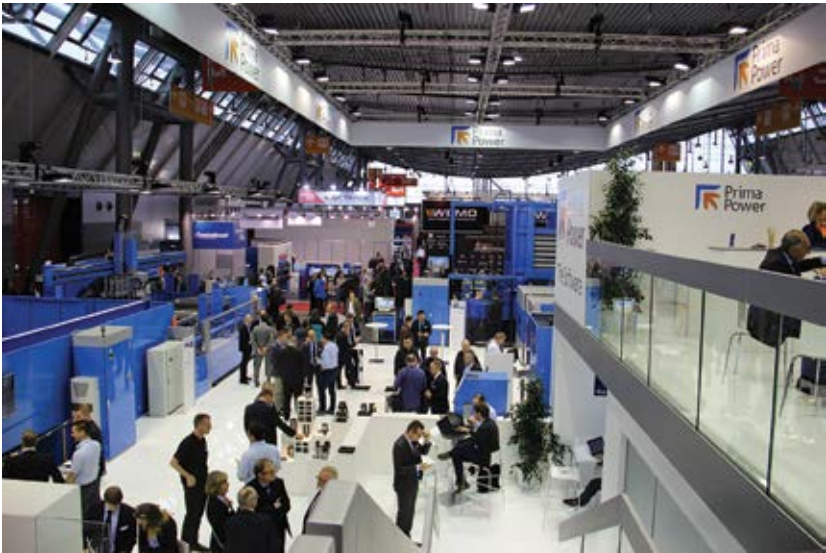
1336 exhibitors from 35 countries, 39,280 visitors from 116 nations, with a strong increase of international audience compared to the previous exhibition, from 24% to 30% – i.e. just less than one third of all visitors. These are some of the key figures of this successful edition of the Blechexpo and Schweisstec 2017.

At the Prima Power booth we had a great turnout, with over 530 registered visitors, more than half coming from countries outside the DACH area (Germany, Austria and Switzerland).

One important attraction at our stand was the possibility for the visitors to live "the factory experience". The Prima Power booth was turned into a true smart factory, with manufacturing systems and a complete FMS line producing real parts, connected and interacting with one another and with the factory/booth by means of a cloud connector. Through our new web application Fleet Manager, machine performance and production were monitored and analyzed in real time.

Many new technologies and solutions by Prima Power had their world premiere at the Blechexpo: the LPBB (Laser cutting - Punching - Buffering - Bending) manufacturing line exhibited for the first time ever at a trade show, the Laser Genius 2D laser cutting machine with a 10 kW fiber laser source for highest performance on all thickness and the eP-1030 servo electric press brake with a new option version to make the handling of heavy pieces easier.





FABTECH 2017 & Open House

Prima Power made a strong impact at FABTECH 2017 held November 6-9 at McCormick Place, Chicago, IL. Heralded as North America's largest metal forming, fabricating, welding & finishing event, FABTECH 2017 covered more than 782,000 net square feet of floor space from more than 1,700 exhibitors, and attracted 44,935 attendees from 120 countries.

Record crowds filled the Prima Power booth each day of the show. Visitors were enthusiastic when they were introduced to the Platino Fiber Evo, an updated version of the Platino Fiber; one of the company's most popular products with more than 2,000 installations worldwide. Platino Fiber Evo is equipped with fiber laser sources of 2, 3, 4, and 6 kW power that provide the customer with high performance and great reliability.

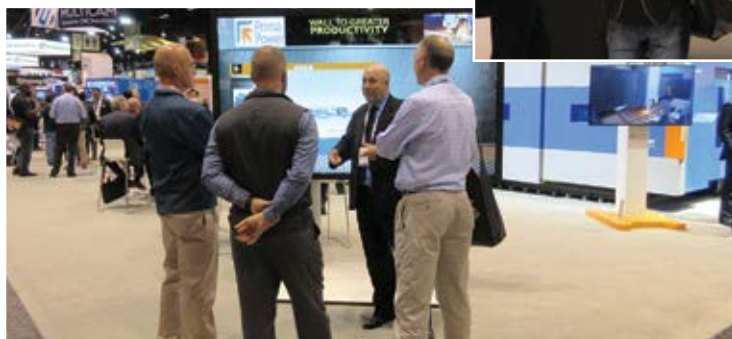
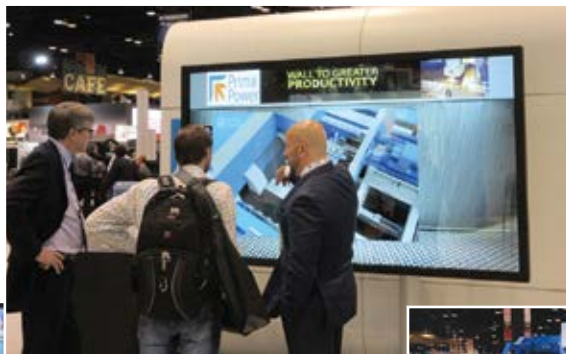
The BCe Smart was another show stopper. The BCe Smart is very flexible and is also ideal for producing small volumes, kits of components, and individual parts with high-quality bending and high repeatability. The compact layout, low maintenance, and quick and easy installation make it a truly unique machine.

The eP servo-electric press brake filled out the product lineup in the Prima Power booth.



Prima Power WALL to Greater Productivity

Another major attraction was the two Prima Power WALLs to Greater Productivity. This 98" interactive touch screen video wall provided access to the wide range of Prima Power technology, machines, and systems that provide greater productivity in sheet metal fabrication. Solutions to production can be easily and quickly realized by selecting a group of products, then narrowing your search to a specific product or system, showing more detailed information and, at your touch, a video to see the machine or system in action.



Open House

For two nights during FABTECH, Prima Power hosted an Open House after show hours at its showroom in Arlington Heights, IL. Visitors were able to get a close-up look at the PSBB, a compact, flexible manufacturing line processing blank sheets into ready-bent high-quality components. Also available was the Platino Fiber Laser with a Compact Tower and other machines.



MWCS 2017

Shanghai, Nov 7-11

With more than 150,000 visitors and about 450 exhibitors, MWCS is the Shanghai trade show where all the core industry sectors come together once a year – from industrial automation, robot, new energy, communication technology, electric power, new energy automobiles, aviation and aerospace, railways, technological innovation and other frontier industries in China.

Prima Power did not miss the chance to participate and showcase its best selling sheet metal machinery.

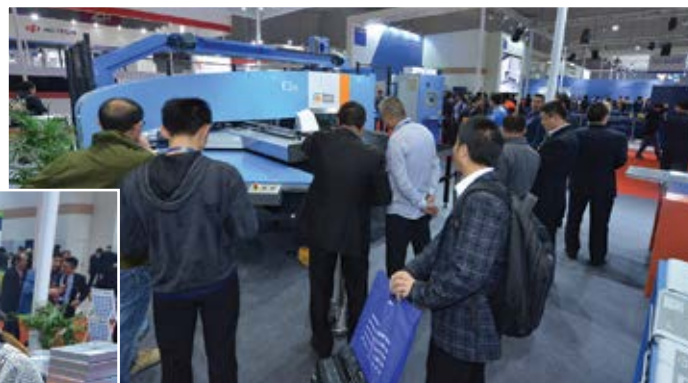
This year, our booth staged two machines, Bce Smart Bending Center and E5x Evolution punching machine with Compact Express for material loading and unloading.

Higher precision, automatic intelligent module, low maintenance cost and labor cost saving are the key machine features that attracted visitors to visit our stand and experience the Prima Power bending center at work.

The production process is fully integrated, providing a set of advanced industrial solutions for users from the factory, office orders, programming, design, materials, manufacturing, maintenance, and centralized management cost.

Today, "Made in China" is striving to reach higher production quality. Improvement of intelligent manufacturing and processing technology has enabled a further integration of the global landscape of Industry 4.0, and China is getting up to speed by pursuing the in-depth fusion of internet and traditional industries, in order to be able to achieve the ambitious goals of the Made in China 2025 plan.

Since The Software is an essential tool of the current industrial revolution, we have connected on-site the two machines, as well as the ones in our showroom, and we have created a dedicated software corner, where our guests had the chance to experience directly how our Tulus software products manage the production process.



BCe Smart...a Leap in Innovation for Qingdao Electric

With nearly 30 years of experience operating out of two plants in Shandong Province, Qingdao Electrical Equipment has established itself as a key long-term supplier for many major players in the electrical industry. The company's client portfolio includes such heavyweights as Schneider and Zhongche. With the larger of their two plants measuring more than 36,000 sq-ft, Qingdao specializes in the production of low- and high-voltage electrical cabinets, storage batteries, and emergency power supply equipment. In 2016, Qingdao Electrical Equipment reached 130 million RMB of turnover, with plans to reach 200 million by the end of 2018.

In July 2017, Prima Power BCe Smart Bending Center was installed in the main Qingdao plant, making it the first high-tech imported machine in the factory. In order to be able to reach the target, the company plans to leverage the machines already in use as much as possible, while also investing in machinery able to guarantee a more sophisticated output and a higher level of automation.

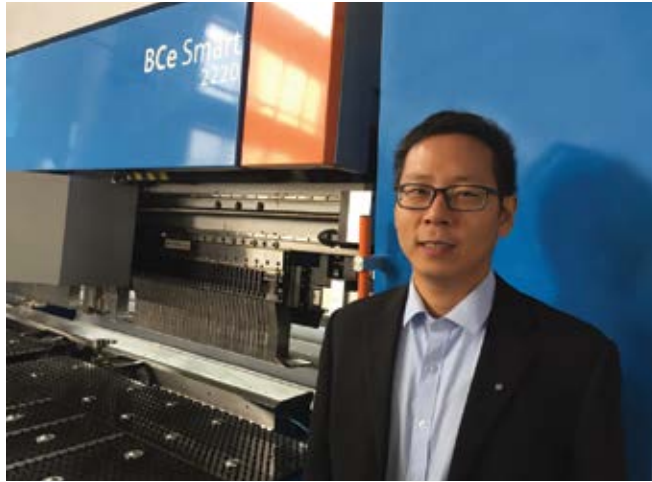


Prima Power's BCe Smart enhancing intelligence, combined with operator ability, makes this machine easy to use and eliminates the margin of error. The BCe Smart guarantees precision and repeatability with a considerable reduction of maintenance costs and production time.



Increased Precision and Automation

Prima Power's BCe Smart enhancing intelligence, combined with operator ability, makes this machine easy to use and eliminates the margin of error.



Prima Power Suzhou sales manager, Frank Fan.

"We used to produce component by component. It was very hard to guarantee the same bending angle for each output, and we often had to reprocess the piece," explains Wang Gong, machine operator. "Now the machine executes the whole process with a much higher level of precision."

BCe Smart guarantees precision and repeatability with a considerable reduction of maintenance costs and production time. "We are now able to produce one piece per minute," continues Wang. "We only need two operators for loading and unloading the larger pieces; for smaller parts one operator is enough. Currently we can produce 4-5 times more output than before."

Sun Xuejun, vice president of technology & production, a 40-year veteran of the company, is the most senior employee in charge of the production line, takes pride in the new BCe Smart. "We



are proud to show Prima Power machinery to our clients when they come visit our factory, to illustrate that our company is actively making an effort to upgrade production and ensure a progressing quality of the product that we offer."

In the upcoming years, Qingdao Electrical Equipment is planning to further improve the production with new laser and punching equipment, aiming to increase automation and invest in machinery that is able to meet sustainability requirements. Prima Power is ready to be the partner and supplier to support Qingdao Electric's growing ambitions, and to provide the right technology for more automation, more precision, and better output quality.

New Generation of Prima Power 3D Lasers Makes Statement at Metro-Detroit Job Shop

Sometimes smooth succession of a family business from one generation to the next doesn't always go as planned. Take, for example, Laser Specialists, Inc., Fraser, MI. Incorporated in 1986, Laser Specialists Inc. was positioned at the forefront of laser cutting technology. Its founder, Thomas J. Paquin, was a pioneer in the laser cutting industry and is credited with introducing one of the first five-axis laser systems to the Metro-Detroit area in 1989. Paquin's unexpected death in 1993 significantly reduced the momentum of this young company in the years following his absence.

Paquin's sons were still children at that time and the courts appointed interim management to run the company that proved unsuccessful in growing the business. It wasn't until 2004 when two of Paquin's sons, Jon and Nick, took control of the laser cutting job shop's leadership. While periods of the last 13 years have been challenging, the years of perseverance, hard work, and savvy equipment procurement have paid many dividends for future success.

Today, Laser Specialists has evolved into a 24,000-square-foot manufacturing center in Fraser, Michigan, equipped with a variety of laser cutting systems. The company also has a 14,000-square-foot warehouse. Its 20 employees work two 10-hours shifts 5-7 days per week. The company has established itself as the premier laser cutting service center of the Midwest by providing modern, cost-effective cutting technology and services for many applications. It is equipped with both 3-axis (2 dimensional), and 5-axis (3 dimensional) laser cutting services.

"I identified Prima Power as being one of the major players in the application of the fiber laser integrated into the CNC, when it was relatively new."

Markets Served

According to Jon Paquin, owner & VP of business development, a majority of the company's customer base is composed of Tier 1, 2, and 3 suppliers to the automotive industry. "We also service customers in such industries as aerospace, military, agriculture, energy, electronics, fitness equipment, etc.," explains Paquin. "We are fairly well diversified. Automotive is still a primary focus for us, being in Metro-Detroit. Our customers range from small, 10-man shops to larger Tier 1 companies."

Building the Laser Arsenal

When Jon and Nick Paquin first took control of the business in 2004,



Jon Paquin, owner & VP of business development (right) and his brother Nick, president, took control of the family business in 2004. While periods of the last 13 years have been challenging, the years of perseverance, hard work, and savvy equipment procurement have paid many dividends for future success.

they were working with limited resources and equipment. "We had two old 5-axis lasers and two 2-axis flat lasers," recalls Paquin. "We started hitting the streets and realized that we had to differentiate ourselves from our competitors. We had to get up to speed on technology and find the latest technology. We began our search and I began to attend trade shows. I came across Prima Power at a FABTECH show and learned the equipment. I identified Prima Power as being one of the major players in the application of the fiber laser integrated into the CNC, when it was relatively new."

Laser Specialists purchased its first Prima Power laser in 2009 – a 3 kW Rapido fiber

laser. The Prima Power Rapido is equipped with a fiber laser source with different powers, according to the type of production. The high-brilliance fiber laser with high-energy efficiency, eco-compatible use, and no maintenance gives the greatest benefits in case of large series production. Many applications take advantage of this source, resulting in lower cycle times and reduced cost per part.

"There were some parts that we were cutting that took up to 5-1/2 minutes on the old machine that we were now able to run at 1-1/2 minutes on the Rapido."



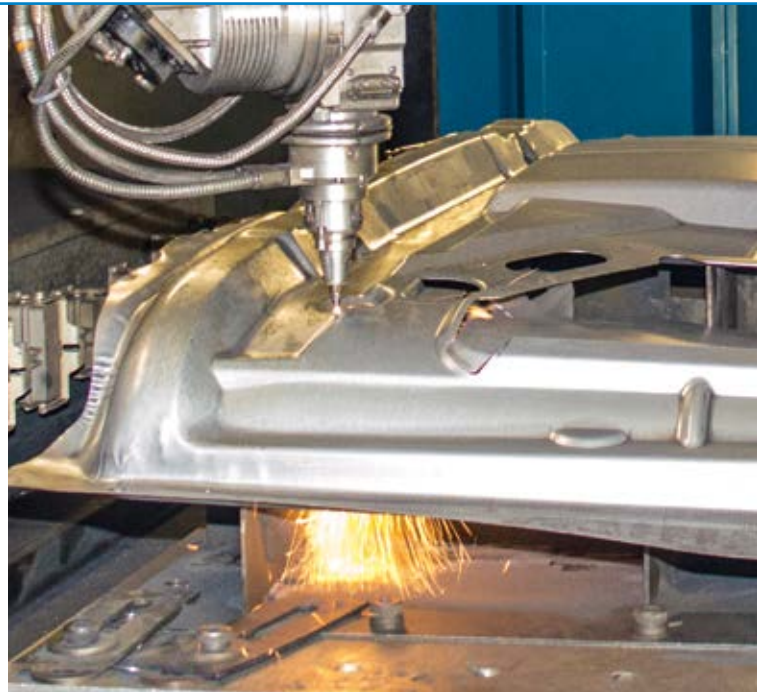
Laser Specialists purchased its first Prima Power laser in 2009 – a 3 kW Rapido fiber laser. The Prima Power Rapido is equipped with a high-brilliance fiber laser featuring high-energy efficiency, eco-compatible use and no maintenance, giving the greatest benefits in case of large series production.

"We were ramping up some programs and had two shifts going on an older CO2 laser doing some higher volume programs," says Paquin. "Taking out some of the labor was just necessary in order to increase our efficiency. There were some parts that we were cutting that took up to 5-1/2 minutes on the old machine that we were now able to run at 1-1/2 minutes on the Rapido. We got more efficient and more versatile through the Prima Power equipment. We mastered the technology and our customers became familiar with us as a company that could turn parts around quickly, within tolerances, and with high quality which were key ingredients to our success."

In 2011, Laser Specialists purchased a 5 kW CO2 Rapido in order to process some thick, heavy-wall tubing.

Laser Next

"By 2015, we continued to grow and came across more production opportunities, and cut a lot of hydroformed tubing," continues Paquin. "We really needed to increase our cutting speed. I carefully studied the hot stamp industry, and the Prima Power Laser Next was the machine that was geared to meet the needs of the niche hot forming market. As a job shop, we took a different approach. We decided to adopt that same equipment to handle not only our production opportunities but our prototype work as well."



The 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.



Laser Specialists has purchased three Prima Power Laser Next machines to keep pace with their growing business.

Automotive part manufacturers need highly-specialized products for the cutting of sheet metal parts, capable of answering 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.

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 Focal Positioning Control allows us to run two jobs simultaneously," explains Nick Paquin, president. "It allows you cut different thicknesses simultaneously, and controlling the Focal Positioning Control gives us the ability to do this without having to do a manual adjustment."

The high-precision and dynamic turntable with servo motor and absolute encoder is designed to

ensure the highest reliability, safety, and ergonomics. With the blocking times, the distance between table and light curtains is very short, allowing faster and more comfortable loading/unloading operations in full safety.

Laser Specialists purchased its second Laser Next in 2016 and its third in 2017. "A lot of times these short run production opportunities open up when a die breaks, or a trim die breaks in production or maybe production dies aren't ready in time when a vehicle is going to production," concludes Jon Paquin. "I have that situation right now with one of our customers. They need a three-month run on four part numbers of 15,000 parts each...all condensed into a two-month time frame. That is 60,000 parts over two months, and without the Prima Power equipment, that is something that we would never be able to do."

Prima Power Software Ecosystem Based On Common Software Platform

By Ivana Montelli, SW Product Manager, Prima Power



The definition of “**software ecosystem**” I like most is: *a set of businesses functioning as a unit and interacting with a shared market for software and services, together with relationships among them. These relationships are frequently underpinned by a common technological platform and operate through the exchange of information.*

This definition fits perfectly with the Prima Power Software products that have been developed recently. This is what Prima Power is applying.

Product developments start from Market/ Customer needs: to connect customer systems, to make fast and safe programming, to optimize production, to receive large amounts of machine data in order to allow intelligent statistics and diagnostics.

Internally, this is translated in a concept of a common software platform with the addition of reserved implementation to different machine technologies: how to program and run Prima Power machines at their best, making manufacturing optimization.

To have a common software platform means to have a development optimization effort, distributed common basic knowledge, and then to be more focused on dedicated technology for each machine category. This guarantee a better and faster growth in terms of products. All software modules work together with others; communication and relationship between them is a must.

NC EXPress e3 Cam offers a common base CAD/CAM system. It has been improved to better program all 2D machines (2D process Laser2D, CombiLaser, Punch/Shear) and also to share parts files with Master BendCam for 3D bending process.

Tulus® HMI

A modern user interface to better support machine productivity, Common HMI framework adopted today by Punch/Shear, Combi, Panel Bender and Laser 2D, with the same look and feel that gives customers the idea of machines belonging to the same machinery group.

Then, from the common HMI platform, dedicated sections are created, each one with the best support to its own specific technology:

- Tulus® Cell for Punch/Shear, Combi
- Tulus® Bend for Panel Bender
- Tulus® Laser for Laser 2D



Tulus Reportings (Production and Performance)

Common machines data collection and common Reportings for all machines.

Tulus Performance Reporting and Tulus Production Reporting can display and export collected machine data to external customer ERP. All Prima Power machines can now give back data about Performance, how the machine works, and Production: how much the machine works. This function is very important for the Industry 4.0 concept of the machine interconnected to customer factory systems.

Tulus Office, Tulus Power Processing

Common Automatic production management.

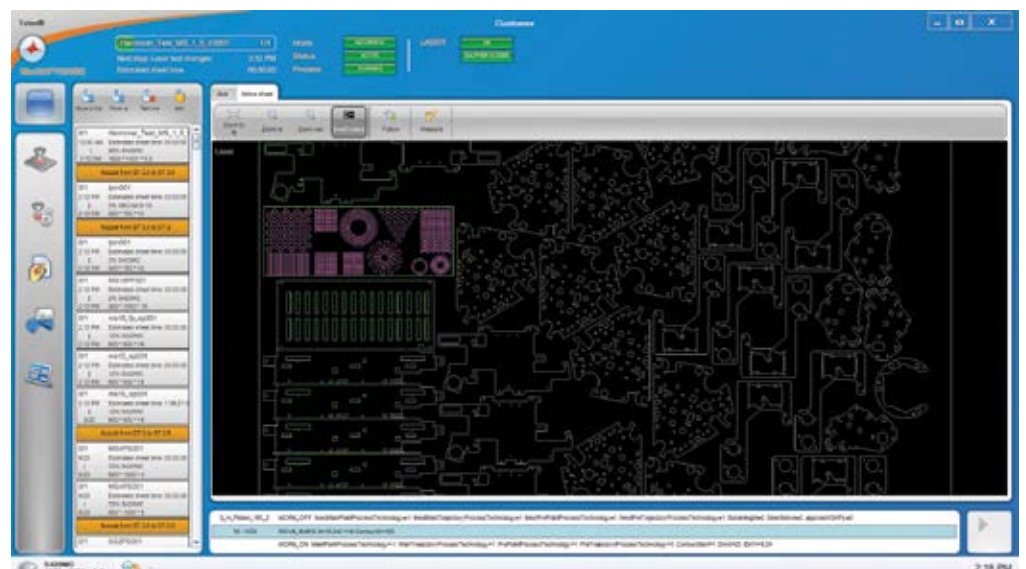
Module for fully automated software operating sheet metal factory to manage automated order management and machine data reporting.

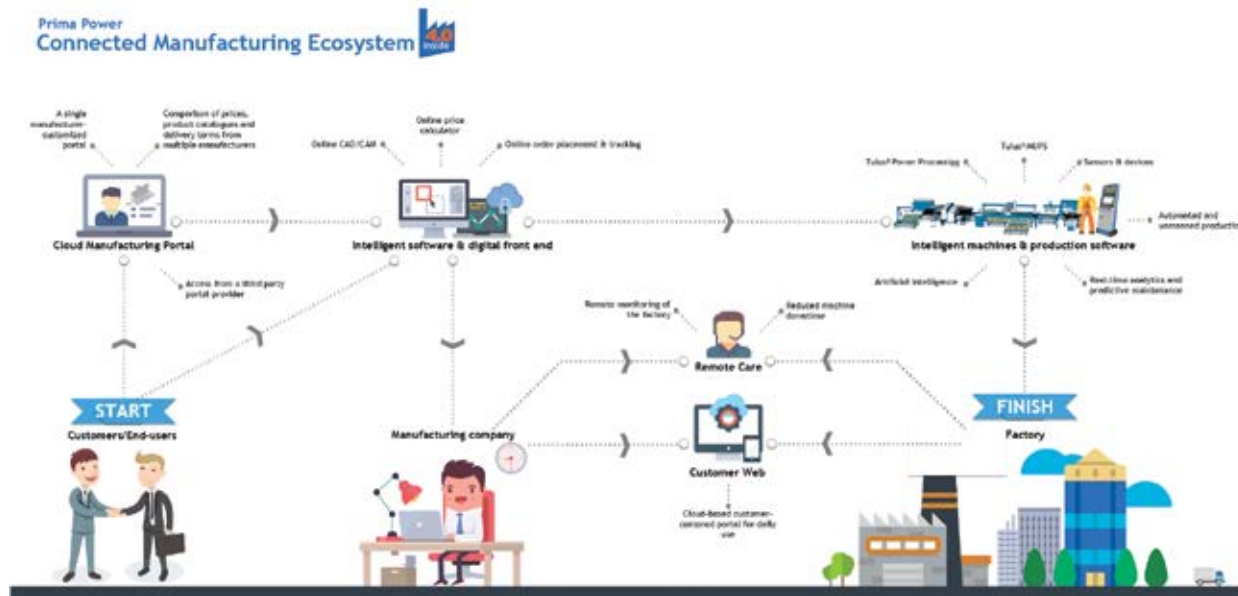
Tulus MUPS

Common Operator Assistant

How to check the Tulus TaskList and nesting info.

Special information about Tools turret management and easy setup.





It's Time for the Next Step Forward.

Now we extend to a Connected Manufacturing Digital Ecosystem to which the Ecosystem Software belongs.

Market pushes to build a IoT system (Internet of Things- Industry 4.0) and Prima Power translates this concept into a specific Service Product: Prima Power Remote Care

A web application, Fleet Manager, has been developed for the Service Department, where it is possible to check huge amounts of collected data from connected machines for monitoring and diagnostic purposes. Data are collected from machines and also sent to Prima Power cloud through a gateway:

- How much customer is running machine
- What really happens during a period of time in terms of each kind of interruption event
- What are top alarms



All group machines connected in the same way, answering:

- phases where automatic operations have been interrupted
- machine data (Raw Data Counter, Time, etc.)
- triggers (every Interruption of process)
- alarms (full details and understanding of events)
- manual operations (user actions)
- video footage (when failure)

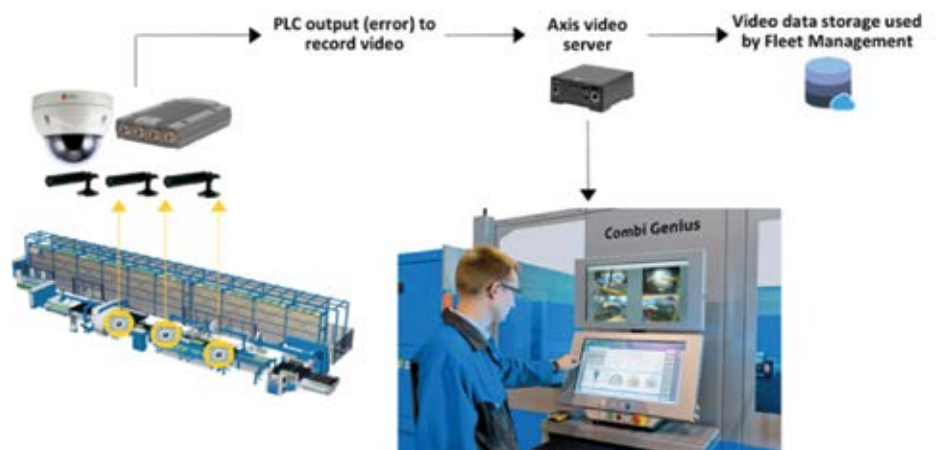
In case of an unexpected intervention, all the information on alarms and triggers collected prior to the interventions provides valuable insights to Service Support to solve the problem and get the machine back running. Timeline is the analytics collecting, displaying and analyzing alarms and triggers collected throughout the machine lifetime. With Timeline, it is easy to rewind to the time when the problem occurred and determine what caused the problem.

Timeline also contains the video, so the service support team is able to give diagnostics in real time.

Remote Care: Connectivity through sensors and cameras

Video timeline:

Cameras streamline data to Timeline in Fleet Management system and to the control unit with touch screen panel.



Tulus® Power Processing Takes Programming Capacity to the Next Level

Suomen Levyprofiili Oy was founded in 1998. The company moved to the new facilities in Joensuu (Finland) in 2014. The main market area is Finland, and products are also exported to several countries in Northern Europe.

SLP Oy's clients include large international companies, which represent the top of their respective industries, such as John Deere and Sandvik. The company's goals in manufacturing subassemblies include serving customers in an optimal manner; offering easy-to-use comprehensive solutions, and building long-term customer relationships.

High-quality sheet metal structures are made of structural steel, stainless, and acid-proof steel, and aluminum, among other things. Approximately 2,000 tons of metal raw material are used in production annually.



Suomen Levyprofiili Oy was founded in 1998. The company moved to the new facilities in Joensuu (Finland) in 2014.

The company's comprehensive service includes partnering with each client from the product development stage and offering technological expertise in product development. The best solutions are developed in cooperation with the client. The design table is where most cost effectiveness originates. The equipment base and processes are also developed on a continuous basis.

Driving Digitalization

Innovative product design and professional manufacturing planning are the company's assets and focus areas.

Production is organized in accordance with the Lean principle and digital solutions are in use. The company is a frontrunner in digitalized workshop manufacturing and the application of Industry 4.0 in Europe.

The Prima Power machines are equipped with integrated sensors and cameras, which continuously gather information in order to improve production efficiency. Machine information is collected and analyzed in real time, which enables preventive maintenance and improved efficiency, performance, and quality.

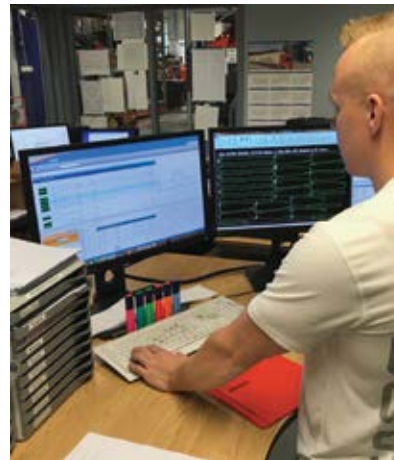
"The company's entire organization is involved in sales, and we are a reliable partner, operating closely with our clients. Good service and adhering to what has been agreed are amongst the key assets," explains Joni Hassinen, programmer for Suomen Levyprofiili. "We are reliable and our own proactive approach provides customers and partners with new solutions and considerable added value."



The existing Prima Power machine base includes two 4 kW Platino 1530 laser cutting machines, both of which are equipped with Compact Tower material storage, and an eP-1336 press brake.

Challenges and Characteristics of Production:

- Highly competitive subcontracting
- Small-scale production
- Short delivery times
- Short timeframes to act and meet customer needs rapidly
- Production of a wide variety of different products
- Continuous development of operations
- Using the most competitive production technologies in order to succeed against international competition



The most recent Prima Power investment includes Tulus® Power Processing software for streamlining part orders and nesting.

Cooperation with Prima Power

The existing Prima Power machine base includes the eP-1336 press brake and two 4 kW Platino 1530 laser cutting machines, both of which are equipped with Compact Tower material storage.

The most recent Prima Power investments include the LST loading and stacking robot for one of the Platino laser cutting machines and the Tulus® Power Processing software for streamlining part orders and nesting.

The user interface in both laser cutting machines is Tulus® Cell and the Tulus® Power Processing software is used in programming. The CAM system used is Prima Power NC Express e3.

"When the machine acquisition was discussed, we considered purchasing a solution that would incorporate Tulus® Power Processing as part of the system. However, we decided not to include it then, but to implement machine connectivity to the production control system



Tulus® Power Processing is a manufacturing system that enables the production process to be managed from ordering, programming, and machine loading, all the way to the completed product and production reporting.

later. The programming capacity became a challenge fairly quickly, because one person's input was not enough to maintain a sufficient work queue in the laser cutting machines. This was in part solved by longer working hours and, at times, getting help from another programmer. We addressed this issue with the Power Processing system," says Hassinen.

“Cooperation with Prima Power has been open and flexible, providing us with the full benefits of the software. Using Tulus® Power Processing has worked really well, and the software has been tailored to meet our needs, which is extremely important for us. All fine-tuning and updates have been performed via remote connectivity, and in problem situations, we have received assistance on the same day.”

Tulus® Power Processing

Tulus® Power Processing is a manufacturing system that enables the production process to be managed from ordering, programming, and machine loading, all the way to the completed product and production reporting. Nevertheless, the decision was made to connect the system to production gradually in order to keep the pace of change under control.

The first stage included implementing Power Processing management of product structure as well as the required parts and part quantities. After that, orders can be sent to production for each product assembly, facilitating analysis and speeding up order preparation. First, the orders are submitted to the programmer on paper and the products to be

programmed are selected. Soon, it will be possible to automatically extract information such as the product structure and order information from the ERP system. This will minimize human error and reduce the need for orders in paper format. The product structure management will also transfer to the ERP system, which will make it possible to submit structure information to Power Processing with the order. This arrangement will eliminate the need to update the structures in two different locations.

With Power Processing, parts can be routed to different work stages. Initially, Suomen Levyprofiili carried out the routing by nesting, cutting (laser), and loading. This is easy to expand in the future, if it is deemed necessary. Manual work stages can also be equipped with a Tulus® Terminal monitor, which can provide additional information

on the tasks included in each stage. The system offers the benefit of real-time information on the production status and the work stages of parts.

Tulus® Power Processing also offers extensive tools for performance and production reporting. Tulus® Production Reporting provides real-time production information on the machine and generates reports on completed production.

Benefits gained in the project:

- More efficient part ordering and nesting
- Clearer ordering process
- Transparent production
- Fewer human errors
- Increased speed and ease of use: one person can easily prepare the nests to be executed for all machines, for three shifts, and even for the buffer.
- Option to integrate the system with the company-wide ERP system
- Accurate back-reporting of data for analysis
- A great leap towards production digitalization

“Cooperation with Prima Power has been open and flexible, providing us with the full benefits of the software. Using Tulus® Power Processing has worked really well, and the software has been tailored to meet our needs, which is extremely important for us. All fine-tuning and updates have been performed via remote connectivity, and in problem situations, we have received assistance on the same day,” concludes Hassinen.

Platino Fiber Evo: The State-of-the-Art Laser Technology

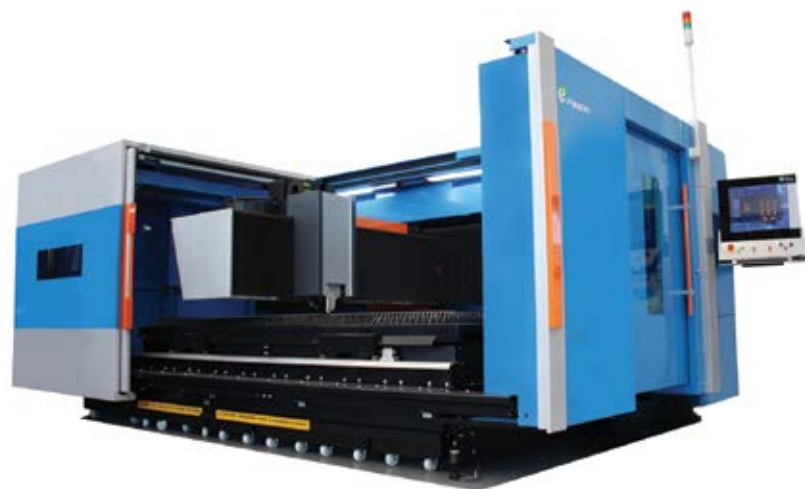
Prima Power presents the new version of Platino Fiber, one of the top products of the Turin company. The 2D laser cutting machine, based on a more than consolidated platform with more than 2,000 installations worldwide, has been upgraded with important technological innovations that contribute to enhanced speed, reliability, and productivity.



Platino Fiber Evo is equipped with fiber laser sources (with 2, 3, 4, and 6 kW power) that provide the customer with high performance and, at the same time, great reliability.

One of the major innovations introduced is a new head for fiber laser cutting, which ensures significant benefits for the customer in terms of machine reliability, increased performance for reduced piercing times and increased cutting speeds (especially on thick material). Also, the new Platino Fiber Evo cabins increase the machine accessibility, reduce its overall dimensions, and are easy to install. This version also features a new generation control, "Open", produced by Prima Electro, that allows easy and complete management of the work programming and machine parameters.

In line with Prima Power tradition, the Platino Fiber Evo has been developed to maximize the customers' competitiveness according to their applications. In fact, the machine is provided with different packages of options dedicated to the various production needs: Smart Cut, Max Cut, and Night Cut.



The Open cabin allows front, lateral, and roof opening. The two lateral sliding doors can be completely opened to ensure excellent accessibility for the operator and allow easy loading and unloading of 1500 x 3000 mm sheet in any configuration.

New Head With Integrated Adaptive Collimator

The main innovation concerns the technological hub of laser machines: the cutting head. Platino Fiber Evo is equipped with the new cutting head with adaptive collimator designed and manufactured by Prima Power. It is a fiber laser cutting head with adaptive optics for automatic management of the focus position and focus radius diameter. Thanks to a quick, reactive, and precise stand-off measurement, the new head is designed for excellent quality and dynamic cutting on all materials, but also for using maximum cutting pressures (certified mechanical structure) and resisting the most demanding environments (totally sealed structure). In line with Prima Power's tradition, process reliability still provides important benefits thanks to the SIPS (Safe Impact Protection System), the lens case equipped with OPC (Optical Precision Control) quick alignment system and protection window case for easy inspection.

The head is equipped with a single focus lens, suitable for all production needs. The protection window is integrated into a dedicated case for easier inspection. The automatic adjustment of the focal position and the beam diameter provides excellent cutting flexibility of various thicknesses without manual intervention by the operator, ensuring maximum productivity.

The OPC (Optical Precision Control) can diagnose any differences between the real position and the theoretical position of the focusing beam and show them on the graphical user interface of the control system. Two knobs located at the front of the cutting head can be used to perform corrections that may be needed to center the lens in virtually no time.

A capacitive sensor keeps the distance between the nozzle and the sheet constant. The system is also equipped with a nozzle calibration and cleaning kit. After executing a predetermined number of holes or machined parts, the machine will automatically clean the nozzles and perform the sensor calibration cycle.



This translates to the customer in improved cutting performance, especially on thicker materials, reduced piercing times, and increased reliability of the entire machine.



The Platino Fiber Evo features the latest generation numeric control designed and manufactured by Prima Electro. Its main functions include laser parameters monitoring and management, work programs editing, and programming management with a complete preview function.

New Cabins

Another important new feature relates to the two new cabins available for Platino Fiber Evo, Lean and Open, which have been successfully introduced on the Laser Genius, another Prima Power 2D laser cutting machine. The Lean cabin is the best solution in terms of compactness, cost and easy installation. With the Open cabin it is possible to utilize the good accessibility provided by cantilever structure of the machine. This cabin allows front, lateral, and roof opening. The two lateral sliding doors can be completely opened to ensure excellent accessibility for the operator and allow easy loading and unloading of 1500 x 3000 mm sheets in any configuration, including automation. Next to the numerical control there is a manual opening sliding door that allows the operator to access the work area for lens replacement and routine maintenance operations.

New Open CNC Numerical Control

Platino Fiber Evo features the latest generation numeric control designed and manufactured by Prima Electro, a company of the Prima Industrie Group. It represents the intelligent and easy-to-use motor of Prima Power machines and provides the basic information to manage and monitor production. Its main functions include laser parameters monitoring and management, work programs editing, and programming management with a complete preview function, also available in real time.

Dedicated Options For Every Production Need

The Smart Cut options suite is the ideal solution for fast processing of thin sheet metal (up to 6 mm thick) for which the nitrogen cutting technology can be used: a result obtained through technological solutions such as Smart Moves or Grid Cutting, which reduces unproductive times, such as the head positioning times. The result is



a dramatic reduction in cycle times up to 30%.

To maximize productivity on parts made of medium and high thickness sheets (6 to 25 mm), the Max Cut options package was created. It is the integration of a customized database and of a series of technological options, achieved after many

years of experience in the field of laser applications. It allows 40% cycle times reduction and a surprising 90% reduction of piercing time.

In case of intensive production, Prima Power has developed the Night Cut options package, which maximizes productivity and provides better process monitoring. This is made possible by devices that control the machining process status and intervene in case of errors restarting the operation or informing the operator remotely; the LPM (Laser Piercing Monitor) controls the piercing operations; Plasma and TipTouch Restart monitor the cut; the email Dispatching prompts the operator in case of problems.



The Platino Evo is equipped with a new cutting head with adaptive collimator designed and manufactured by Prima Power. It is a fiber laser cutting head with adaptive optics for automatic management of the focus position and focus radius diameter.

Industry 4.0 Inside

Like all models produced by Prima Power, the Platino Fiber Evo is also Industry 4.0 inside. The Industry 4.0 concept also provides a concrete improvement in production operations within the company. Due to the big data analysis, production process planning, and real-time monitoring, it is possible to achieve the optimization of complex processes and the intelligent management of the production cycle, with significant savings in terms of time and money.

**For more information: www.primapower.com
info@primapower.com**

Refrigeration Company Installs One of the Largest Prima Power FMS in the UK

Prima Power has delivered one of its largest Flexible Manufacturing Systems installed in the UK. The highly-efficient FMS now provides the well-known refrigeration manufacturer, Epta UK, with unmanned, lights-out fabrication production capabilities. Today, the company is renowned in the UK and beyond for its in-depth knowledge of, and its vast experience in, the design and production of custom-made refrigerated units.

Epta UK is an important part of the EPTA Group, providing industry-leading product management, system design, and a range of manufacturing capabilities that result in the delivery of advanced refrigeration solutions. Since its absorption into the EPTA Group, Epta UK has continued to enhance its process in terms of technological know-how and manufacturing skills.



The Night Train FMS is able to perform high-speed laser cutting, punching and forming, as well as the storing of raw and processed material and parts. Prima Power's LPe8f Combi machine lies at the heart of the highly productive FMS that was designed to satisfy Epta UK's specific demands.

The company's impressive Bradford-based production facility was renovated and expanded in 2007 and now covers 19,500 square meters. Ever-increasing levels of demand for the company's refrigeration products recently prompted Epta UK's staff to search for a highly-efficient, automated system that would produce the required quality, as well as quantity of fabricated parts.

After considering a couple of alternative systems, a demonstration of the Night Train FMS® (Flexible Manufacturing System) proved that the advanced Prima Power solution was able to satisfy all of Epta UK's challenging requirements. The FMS is able to perform high-speed laser cutting, punching and forming, as well as the storing of raw and processed material and parts. Prima Power's LPe8f Combi machine lies at the heart of the highly-productive FMS that was designed to satisfy Epta UK's specific demands.

"As an established market leader, we currently employ approximately 540 people, both locally and nationally. Our staff works closely with major food retail groups on the design, production, and installation of custom refrigeration cabinets," explains Simon Hayes, Methods & Technology, at Epta UK. "Our cutting-edge designs and the quality of our refrigeration products are major factors in our continuing success. In order to keep pace with growing demand, and to ensure the continued quality of our products, we recently looked for a comprehensive fabrication manufacturing solution. After deciding that the Prima Power system would deliver the needed major boost to production, our meetings and close cooperation with Prima Power's staff resulted in the development of what is the ideal Flexible Manufacturing System for both our current and our foreseeable needs." Since its installation Prima Power's Night Train FMS® has proven its



High performance Prima Power machine tools, integrated cells, automatic material handling solutions and software components are combined, and due to the sheer breadth of Prima Power's offerings, the optimum, cost-effective solution can always be created.

“The use of the Night Train FMS® with its unmanned, lights-out capabilities means that we have minimized part manufacturing times and maximized available production time.”

ability to integrate an entire fabrication process into a single, all-embracing manufacturing cell. The smart system provides automatic material handling and includes intelligent buffering. Automatic information flow from programming to production reporting is also a major benefit.

“The use of the Night Train FMS® with its unmanned, lights-out capabilities means that we have minimized part manufacturing times and maximized available production time,” Hayes continues. “Prima Power’s Night Train FMS® takes up much less floor space than each of the individual manufacturing and storage elements would if purchased as separate units. Also, the system ensures less work-in-progress at any given time, resulting in a reduced requirement for storage. Prima Power’s Night Train FMS® takes care of all logistic operations, such as sheet-metal and manufactured component movements and all storage needs. The highly-productive core of our new FMS is the Prima Power LPe8f Combi. This extremely flexible machine gives us the advantage of multiple Prima Power technologies: laser cutting, punching, and forming all combined in the same adaptable package. We use the LPe8f Combi’s turret punch press when it is easier or faster, and the laser when we need flexibility. Depending on the task at hand, we are always able to choose the most productive manufacturing method.”

Night Train FMS

Prima Power’s Night Train FMS® automates the entire material and information systems of a production facility, and combines all individual manufacturing stages into a single cohesive and flexible process. All Night Train FMS® systems are carefully tailored to suit customer-specific



Prima Power’s Night Train FMS® automates the entire material and information systems of a production facility, and combines all individual manufacturing stages into a single cohesive and flexible process. All Night Train FMS® systems are carefully tailored to suit customer-specific needs and are designed to incorporate the most appropriate elements from Prima Power’s comprehensive range.



Since its installation Prima Power’s Night Train FMS® has proven its ability to integrate an entire fabrication process into a single, all-embracing manufacturing cell. The smart system provides automatic material handling and includes intelligent buffering. Automatic information flow from programming to production reporting is also a major benefit.

needs and are designed to incorporate the most appropriate elements from Prima Power’s comprehensive range. High-performance Prima Power machine tools, integrated cells, automatic material handling solutions and software components are combined, and due to the sheer breadth of Prima Power’s offerings, the optimum, cost-effective solution can always be created.

“The system’s great flexibility means that we now need much shorter lead times for the introduction of new products and for product changes.”

The COMBI LPe8f – An Innovative ‘Four-in-One’ Solution

Prima Power’s LPe8f combines advanced servo-electric and cutting-edge fiber laser technologies in a manufacturing solution that offers outstanding flexibility, speed, accuracy, and productivity. Accurate fiber laser cutting, punching, forming, and bending tasks are performed at high speeds. Ease of operation, a large tooling capacity, and minimum setup times add to the efficiency of the advanced Prima Power machine.

“As part of the EPTA Group, we adhere to the group’s strict environmental policies that are focused on ensuring energy conservation and environmental impact reduction. We pursue these policies through initiatives such as the use of F-Gas compliant natural refrigerants,” concludes Hayes. “Our purchase of the Night Train FMS®, incorporating the LPe8f Combi, further reduces our manufacturing environmental impact as, due to the use of technologies such as servo-electric punching and advanced fiber laser cutting, the FMS has very low energy consumption requirements. It helps that we now experience practically zero time for setup changes, as we are able to make fast, automatic changes from one product to another. Also, the system’s great flexibility means that we now need much shorter lead times for the introduction of new products and for product changes.”

Productivity, Quality, and Capability in Laser Welding Sheet Metal Components Increased With SmartTechniques™



SmartTechniques™ from Prima Power Laserdyne includes SmartRamp™ to prevent defects at the start and end of a weld. Photo One (left) shows result from a conventional laser welding process with an end point defect in the 10 o'clock position resulting from laser power ramping. Photo Two (right) shows no defect resulting from the SmartRamp™ process.

The availability of high power fiber lasers has provided the drive for creating a suite of new capabilities from Prima Power Laserdyne, called SmartTechniques™, that increase the productivity, quality, and capability of laser welding as well as laser cutting and drilling.

Both the CW (continuous wave) and QCW (quasi-continuous wave) fiber laser sources provide a combination of wavelength, beam quality, and power to make existing processes better and/or faster. Another feature of these laser sources is the speed and precision with which laser parameters can be controlled.

SmartRamp™ Provides Precise Control of The Laser Process To Prevent Defects at The End of a Weld

With standard laser welding practice, the laser power is ramped down at the end of the weld. If the weld is closed, as shown in (Photo One), the ramp down occurs after the start point has been over-lapped, leaving a depression at the end point.

For most applications, this depression is undesirable but has been considered “just the way it is” for laser welding. This commonly accepted condition can have important consequences. For example:

- In hermetic welding, the depression at the end can be a leak point (Photo One)

- For applications requiring high fatigue strength, the depression represents a stress-riser for possible premature weld failure.
- For cosmetic welds, appearance of a visual depression often causes quality concerns requiring additional secondary inspection and finishing processes.

Using SmartRamp, laser parameters are controlled in conjunction with motion to prevent the depression at the end of the weld, as shown in (Photo Two). The result is consistently high quality welds with reduced porosity at the end of the weld and, more importantly, with consistent crown and less undercut of the top bead along the entire weld.

SmartShield™ Protects The Lens Coverslide Using Clean Compressed Air While Supplying Shield Gas To Protect The Weld

A second SmartTechnique important for laser welding is the patent pending SmartShield™. SmartShield provides simultaneous shielding of the laser weld and protection of laser system optics without mixing shield and protection gases. (Photo Three)

SmartShield provides a high velocity compressed air (for lowest operating cost) barrier that prevents metal sparks from the weld zone from contaminating the protective lens cover slide.

SmartShield also provides a controlled atmosphere for the weld zone while it is molten and while it is cooling to a temperature at which it will no longer be affected by the ambient atmosphere. SmartShield is available with a range of shield gas delivery devices including welding shoe, side jets and coaxial gas nozzle tips that best fit the material and weld joint design.

SmartShield makes use of compressed shop air for protecting the lens coverslide and a shield gas for protecting the weld. A major difference between SmartShield and other air-knife designs is that the gas for protecting optics from the SmartShield cross-jet does not contaminate the welding shield gas.



Photo Three: SmartShield™ patent pending nozzle assembly protects the lens coverslide using clean compressed air while supplying shield gas, such as nitrogen or argon, to protect the weld from oxidation.

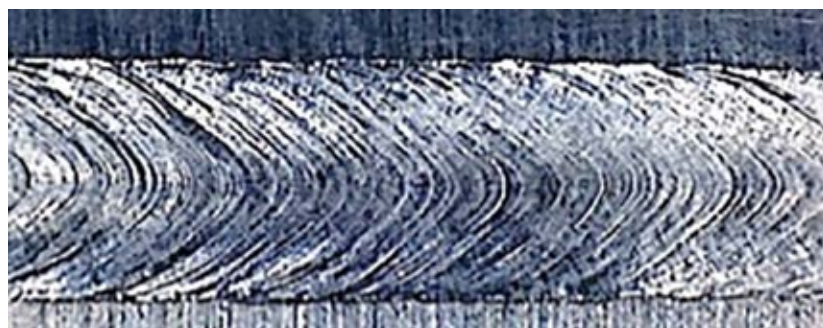


Photo Four: Top bead of a lap weld of 304 stainless steel and zinc coated steel.

Application To Welding Dissimilar Sheet Metal Parts

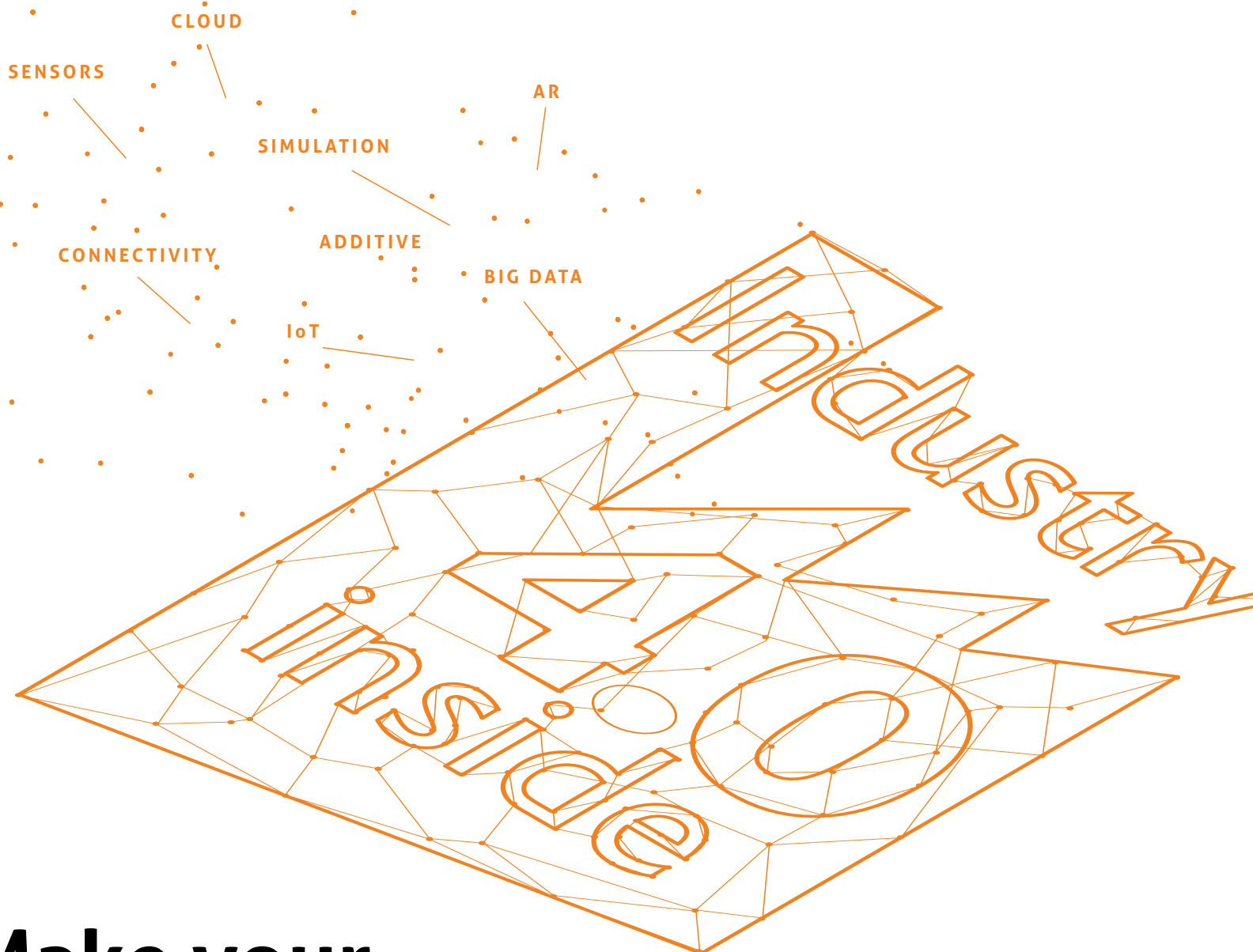
Applying SmartTechniques for creating products using similar and dissimilar metals and alloys greatly increases design and production flexibility. Optimizing properties, such as corrosion, wear, and heat resistance of the finished product while managing its cost, is a common motivation for dissimilar metal welding.

(Photo Four) shows an example of welding 304 stainless steel and zinc (Zn) coated carbon steel, a combination that has found widespread use in applications as diverse as kitchen appliances and aeronautic components.

Let Us Help You Develop a New Laser Welding Application

Prima Power Laserdyne applications engineers have decades of experience applying laser welding to industrial applications. Contact your local Prima Power office to review your laser welding application.

For additional information about this and other laser welding applications, visit https://www.primapower.com/laserdyne_welding



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