Bystronic

WORLD

02-2018

08 # The smart revolution

The magazine for cutting, bending, and automation

Contents

"Industry 4.0 means not only putting digital tools to clever use, but above all also a new mindset."

Urs Reimann, Head of Digital Transformation Bystronic

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Alex Waser, CEO ▸

Dear reader,

Children learn things in a playful way. They have no reservations – no matter if it involves language or technology. Their curiosity is so great that they are not afraid of doing something wrong. Children simply try things out and learn from their mistakes.

This is precisely how we should approach the topic of Industry 4.0: with curiosity, openness, and a willingness to experiment. Because no one knows exactly where the journey will take us. There is no master plan for the digital transformation. The greatest mistake would be to do nothing at all. Because only those who courageously try out new things can develop further.

The challenges of the digital transformation are not only of a technological nature. They also require a cultural change. It is not just about networking machines, but above all also about networking people and companies. Industry must intensify its exchange of information and the sharing of know-how. Because no company can master the digital transformation on its own.

In concrete terms, this means for us that we are establishing an even closer network with our customers. The mutual exchange of data helps us to tailor our products and services even more effectively to their requirements. And this in turn enables our customers to make their production even more efficient.

I wish you an exciting read and encourage you to face the digital transformation with the courage to experiment.

Alex Waser
CEO

IMPRINT

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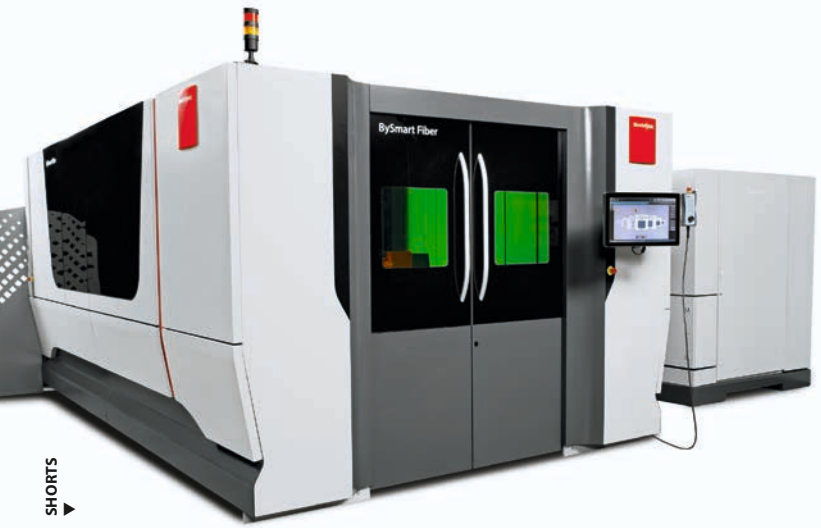
How do you like the new World magazine? We are looking forward to your feedback. Write to us at **stefan.jermann@bystronic.com**

Bystronic NEWS



BySmart Fiber: the new generation

With the new BySmart Fiber, Bystronic offers an entry-level fiber laser with a head start. Up to 6 kilowatts of laser power and suitable automation solutions allow users to exploit the full potential of fiber laser technology.

Bystronic's newly developed fiber laser is aimed at sheet metal processing companies that want to establish themselves on the market with a high-performance cutting system. The BySmart Fiber leaves nothing to be desired: a high parts output, a wide spectrum of applications, suitable automation solutions, and all this at an entry-level price.

newbysmartfiber.bystronic.com

EUROBLECH 2018

World Class Manufacturing

Experience the future of sheet metal processing with Bystronic. Discover "World Class Manufacturing". At EuroBLECH 2018 starting on October 23, 2018 in Hanover, we will present you our latest solutions for your manufacturing environment.

Solutions for every budget

Bystronic stands for outstanding quality. This claim also applies to our refurbished machines. During the general overhaul of the laser cutting system, it is upgraded with the latest components. The refurbishment process is based on extensive know-how and uses only original spare parts. A refurbished machine undergoes rigorous quality inspections and therefore fulfils Bystronic s high quality standards.

www.bystronic.com/en/refurbished-machines

TAIWAN: Experience Center

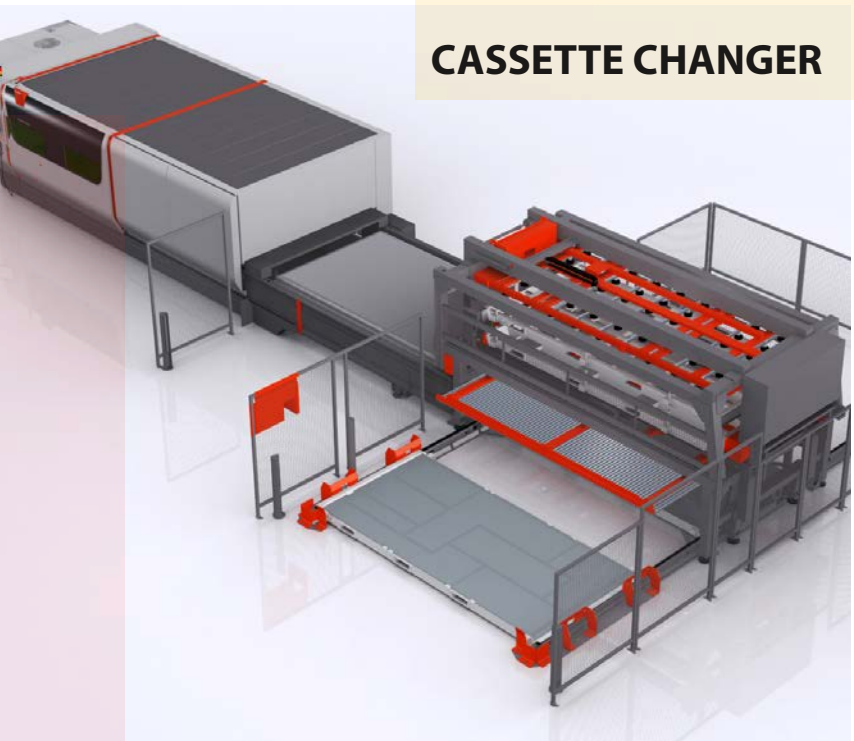
The new location in Taipei with its Experience Center was ceremonially opened in mid-May. At Bystronic, this traditionally calls for a Swiss cowbell. With the new Experience Center, Bystronic is expanding its consulting, sales, and customer service infrastructure and is thus getting even closer to its customers in Taiwan.

70%

SHAREHOLDING IN ANTIL

In order to serve growing customer demands in the field of automation even more comprehensively, Bystronic is acquiring 70 percent of the shares of Antil S.p.A. In future, this will provide our customers with access to an even broader range of technologies for automated sheet metal processing.

CASSETTE CHANGER



Innovation for ByTrans Extended

Bystronic has increased the range of functions for the automated loading and unloading in the laser cutting process. The new "Cassette Changer" option enhances the unloading cycle of the ByTrans Extended automation system. This new option is of particular interest to users who utilize the ByTrans Extended as a stand-alone solution without connection to a storage solution. In this way, the laser cutting process can be automated in a space-saving and flexible manner.

AUSTRIA: more space, more service

Bystronic Austria has strengthened its sales and service capabilities with new employees. This June, the team also moved from its previous location in Linz to new offices in Pasching. "With the new business location in Pasching, we are now prepared for the future. The generous offices offer us the necessary space to grow," says Managing Director Gerald Kastner. Thanks to a spacious training center at the new location, Bystronic Austria will also be able to offer its customers software training courses.

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Stay informed and follow us on

www.linkedin.com/company/BystronicGroup

www.youtube.com/user/BystronicBestChoice

Trend NEWS

Virtual furniture and machine pools

Unity Technologies is the largest global supplier of augmented reality software. Today, the fields of application extend far beyond video games. Ikea, for example, uses Unity to enable customers to try out virtual furniture in their living rooms. However, augmented reality also has great potential for the industry: For example, it can be used to visualize machine pools or to assist maintenance work.
unity3d.com

Gravity

TAKING OFF WITH JET PROPULSION

The dream of flying is as old as humankind itself. Countless inventors have attempted to turn this vision into reality. Richard Browning is the first to take this idea into series production. The British entrepreneur has developed a suit with jet propulsion that has what it takes to get off to a flying start. His company Gravity Industries is already worth several million and is likely to attract considerable attention in the future.
www.gravity.co

Worldwide twittering

Which topics are currently being discussed on Twitter in London, New York, and Shanghai? Trendsmap reveals just this. The website developed by Stateless Systems evaluates local Twitter feeds and displays them as a tag cloud on an interactive world map. Currently, the website covers over 1,300 cities worldwide.
www.trendsmap.com

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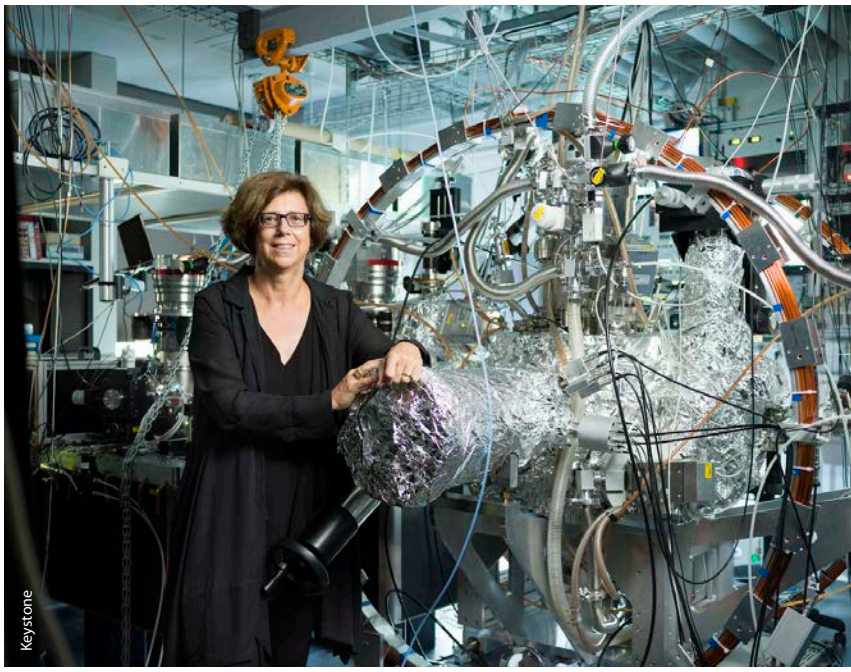
INVENTOR AWARD

PIONEER IN LASER TECHNOLOGY

The Swiss physicist Ursula Keller has been awarded the European Inventor Award 2018 for lifetime achievement. The ETH professor has thus been recognized as a pioneer for new applications of laser light. During her more than 30-year career in research, Keller invented the first method for generating ultrafast light pulses in lasers, known as Sesam (semiconductor saturable absorber mirror). She thus paved the way for new, previously unimaginable applications.



Keystone

THE HUMAN OF THE FUTUR

From Homo sapiens to Homo deus – the human being of the future. Yuval Noah Harari has already made history with his book "Sapiens". Now he has outlined a future scenario for tomorrow's "super-human" who is driven by technology and will even overcome mortality. The New York Times bestseller "Homo Deus" is a breathtaking inspiration for thought that will certainly trigger discussions.

Homo Deus: A Brief History of Tomorrow
Yuval Noah Harari, 448 pages

GDI

Visions for public space

Cities are becoming denser: More and more people are sharing less and less space. At the same time, urban space is changing. New working environments, changing mobility, conflicting goals between locals and tourists, or the restructuring of the retail sector all contribute towards this development. What does this mean for public space? With its latest report, the Swiss Gottlieb Duttweiler Institute (GDI) provides an insight into the cities of the future.
www.gdi.ch

The smart revolution:

Of intelligent factories, data crude oil, and new mindsets

The benefits of digitalization for manufacturing companies are becoming increasingly apparent. The promises of Industry 4.0: increased efficiency, flexibility, and transparency.

Text: Stefan Jermann and Ralph Hofbauer Illustrations: Priska Wenger

↘ Every day, anyone working in the industrial sector is a part of history in the making. Because the fourth industrial revolution is in full swing. The prime objective: greater efficiency. The factory of the future is intelligent and embodies the lean principle. It continuously optimizes its own production processes.

In addition to technological innovations, data is the primary driver of this development. Data is the crude oil of digital business, also in the industrial sector. Those companies that networks their machine, tool, product, and customer data most intelligently will have the competitive edge in the digital transformation.

Customized mass production

In addition to efficiency gains, Industry 4.0 offers manufacturing companies increased flexibility. The intelligent, modular factory is designed to resolve the paradox of individually customized mass production: The smart factory allows highly flexible ad hoc production at high speeds. This means that small series or even one-off items can be manufactured at conditions similar to standardized mass products.

Radio-frequency identification (RFID): RFID chips enable the automatic identification of objects. One day, products will thus be capable of controlling their own manufacturing process and will be able to be traced back to their origin.

Illustration title:
VR/AR: While virtual reality creates an artificial world, augmented reality enriches the real world with virtual information. Both technologies can be used as mediators for increasingly abstract industrial processes – be it for planning, training, or maintenance.

Cloud computing: Rather than being stored on a central server, the data from the smart factory is collected in a data cloud. This is the only way to evaluate the data in real time and use it regardless of location.

Collaborative robotics (cobotics): In addition to autonomous robots that work independently, collaborative robots are gaining in importance. Cobots work closely with people and support them with strenuous work.

Internet of Things (IoT): Intelligent sensors are the sensory organs of the smart factory. Because they are connected to the Internet, machines can give feedback on their status and communicate with other devices.

Finally, the digital transformation ensures increased transparency because it means that suppliers, manufacturers, and end customers are more closely interlinked. Products can be traced back to their origin without any gaps. Customers are guaranteed sustainability, for which they pay not only with money but also with their data – which in turn strengthens customer loyalty.

Cast off blinders

All these changes also require a cultural change. The industry must systematically align its mindset, structures, and processes with digital business models. And companies must open up and network – be it with customers, suppliers, or with researchers and other industrial companies. Only in this way can they benefit from the opportunities of digitalization. ■

Data mountains and material flows

Big data offers great opportunities for the industry to enhance efficiency. The challenge is to extract useful information from the growing amounts of data.

The global mountain of data is growing and growing. At present, the data growth is accelerating by around 30 percent annually. In 2016 alone, around 16 zettabytes of data were created worldwide, that's 16 trillion gigabytes. A report by the hard drive manufacturer Seagate predicts that ten times as much data will be generated in 2025: 163 zettabytes – a mountain of data 500 times the size of all the movies on Netflix.

The networking of devices and machines on the Internet of Things (IoT) will further boost the creation of data – not least because companies are increasingly utilizing IoT technologies. In addition to home users, it will above all be companies that will cause the continued growth of the mountains of data in the future, because they collect and network data from machines, products, and customers.

Data yes, but information?

As a result, companies are increasingly confronted with data volumes that are too complex to be evaluated using conventional data processing methods. Big data is the buzzword that is also gaining relevance in the industrial sector. "Companies must learn to manage data," says Konrad Wegener, Professor at the Swiss Federal Institute of Technology in Zurich (ETH) and Director of the Institute for Machine Tools and Manufacturing (IWF). "The challenge is to extract useful information from the vast amounts of data."

The big data trend can lead companies to euphorically launch into the topic. But blindly collecting data is of little use. Rather, it is necessary to establish a contextual reference in order to be able to draw conclusions. In addition, a company must consider exactly what benefit the data is to provide: "Data collection should only begin when you know which business model the data is supposed to serve," says Professor Wegener. For production companies, the primary objective is to optimize material flows and make processes more efficient.

Drawing the right conclusions

Data is regarded as the crude oil of the future – and just as crude oil first has to be refined in order to be of use, data in its crude state is of little value. When condensing data into information, it is important to identify recurring patterns. However, these should be interpreted with caution. According to Professor Wegener, supposedly scientific studies regularly provide examples of how easily questionable conclusions can be drawn from statistical patterns. In order to obtain informative analyses and to network data in a beneficial manner, special know-how is required that often only external experts can offer. However, internal specialists are also indispensable, since the data must be continuously maintained.

"The intelligent networking of data can generate information we don't have today."

Konrad Wegener, Head of the Institute of Machine Tools and Manufacturing (IWF) at ETH Zurich

After analyzing the data, the ultimate objective is to provide users with access to meaningful evaluations using intuitive interfaces. "Actually, the employee should not even see big data, let alone have to handle any raw data," Professor Wegener says. Nevertheless, requirements are changing: In the future, more than ever before, employees must be able to understand and, if necessary, optimize production processes.

Data protection as a major hurdle

In order to derive a benefit from big data, companies must be willing to share data with their business partners. It would be desirable for manufacturers of machines and the companies that use them to increasingly exchange data in order to optimize processes and machines. However, many manufacturing companies have reservations because they do not want to pass on sensitive production or customer data: "This is hampering the development of Industry 4.0," Professor Wegener observes.

While we barely worry about what happens to our data when we use smartphones privately, as the user benefits predominate, for the time being the industry is finding it difficult to illustrate and recognize the benefits of data. However, concerns about data security are not unjustified, since networking within the framework of Industry 4.0 offers new potential targets for industrial espionage. ■

BIG DATA IN FIVE STEPS

1. Define benefits
The very first step is to define which business model the data is supposed to serve. For example, is the goal to optimize production or sales?

2. Analyze data flows
Information stream mapping (ISM) can help gain an overview of who in the company generates data and who needs data.

3. Collect data
In production environments, workspace monitoring using image data analyses or status sensors on machines are viable options. Time stamps are valuable for the tracking of material flows and establishing a contextual reference.

4. Evaluate data
When evaluating the data, it is advisable to work with external partners, as the required methods, such as correlation analysis, can be very complex.

5. Create interfaces
In order for employees to be able to use big data efficiently, the results of the data analyses must be transferred to intuitive user interfaces and made available in a manner that is suitable for the situation, location, and function.

When the factory thinks ahead

The vision of Industry 4.0 is the smart manufacturing environment. A factory in which, to a large extent, production systems organize and optimize themselves – thanks to intelligent technologies.

The year is 2030. A tour of a smart factory: An order has been submitted and production starts. The job is complex, each part is unique, but the pace is as fast as with mass production. The products control their own manufacturing process. They inform the machines and the robots about the adjustments that are required. These, in turn, understand each other blindly like colleagues who have worked together for many years. The workshop manager monitors the production process on his tablet computer. Quality control is achieved in a purely virtual process.

"The factory of the future is intelligent, highly networked, and extremely flexible," says Dominic Gorecky, Head of the Swiss Smart Factory, the competence center for Industry 4.0 at the Switzerland Innovation Park in Biel. Gorecky illustrates the principle of the smart factory using three digital cubes. He shakes them, and a number appears on each cube. Regardless of the order in which he lines them up, the third cube always displays the sum of the first two. This modularity could also allow machines to automatically connect with each other after having been placed in an intelligent manufacturing environment. "But this will only succeed if the industry agrees on standards."

Plug-and-play for the industrial sector

Gorecky is convinced that one day the plug-and-play concept will also establish itself in the industrial sector: "In the smart factory, a Japanese robot and a Swiss machine tool will immediately understand each other. After a brief introduction, they start working together." Today, networking machines from different manufacturers still entails a great deal of work. Because the lack of standards means that compatibility is usually not ensured, sensors must first be installed, interfaces created, and programming languages translated.

"The factory of the future is highly networked and extremely flexible."

Dominic Gorecky, Head of the Swiss Smart Factory

There is still a long way to go before the vision of a completely networked factory becomes reality. But the innovation projects that are being implemented in the Swiss Smart Factory show that some elements have long since been achieved. Devices communicate with each other over the Internet of Things (IOT). Collaborative robots are working with humans in an increasingly intuitive manner. Virtual reality can be used for training and augmented reality for the planning of assembly lines. The key technologies are already available, but they are far from being fully exploited. There is still a lot of work to be done.

Three levels of transformation

The transformation process to the smart factory is taking place on three levels:

1. Vertical integration
The separate fields of IT (information technology) and OT (operational technology) will grow together in the smart factory. "From shop floor to top floor" is the motto. The aim is to establish as many data collection points in the manufacturing environment as possible in order to create a database that the management can use to optimize processes.

2. Horizontal integration
The goal is a digital supply chain in which suppliers, manufacturers, and end customers are all networked. This allows products to be tracked seamlessly and material flows to be continuously optimized.

3. Digital synchronization
Last but not least, the real world must be synchronized with the digital world. Because everything that is used and produced in the smart factory must also exist as a "digital twin". This twin can be inserted into simulated environments – be it to test production processes, determine maintenance requirements, or to perform quality controls.

Who is in charge – human or machine?

The road to the smart factory not only entails technical challenges but also social and ethical ones: Which jobs should be performed by humans, and which by robots? What does it mean to deploy artificial intelligence to help employees? And who makes the decisions in the smart factory – human or machine? Dominic Gorecky is convinced that in the smart factory, the human being will retain the decision-making authority, provided that society deals with these issues in good time.

The complex challenges that the smart factory entails can only be solved together: "Companies must network in order to take advantage of the opportunities offered by Industry 4.0," Gorecky emphasizes. The great interest in the network of the Swiss Smart Factory, which was founded just one year ago, shows that an increasing number of companies are prepared to take this step. The future lies in networking. This applies to both people and machines. ■

A step ahead of the transformation

The digital transformation is not only a technological challenge but also a cultural one. This is why Bystronic has anchored this topic in the company as a whole. This will benefit customers: The digital portfolio is growing, as is the know-how required for the digitalization of processes.

From the media sector to the financial system, and right through to the retail business – digitalization has already severely disrupted most sectors. Many companies have had to rethink and realign their business models. The sheet metal processing industry, on the other hand, is still in the midst of the digital transformation. Although everyone is talking about Industry 4.0, only very few companies have dared tackle the topic.

Bystronic recognized the opportunities of digitalization at an early stage and rigorously expanded its digital portfolio based on its customers' requirements. For example, the developers of the ByCockpit app maintained close contact with sheet metal manufacturing companies in order to develop the most convenient solution possible for the evaluation and visualization of process data. One year after the launch, the positive customer feedback shows: The app provides valuable support for the optimization of production processes. In addition, the MES software allows all production process steps to be digitally networked – a first step on the road towards the smart factory. Additional innovations are in the pipeline: An augmented reality solution is currently in the development phase, which will support customers with the operation and maintenance of their machines.

Digital strategy with clear objectives

In addition to the portfolio, the organization as such is changing. The management's clear commitment to investing in the digital future also entails cultural and structural changes. Bystronic is developing from a machine manufacturer into a supplier of end-to-end solutions. This transformation process requires stronger global networking of the organization. In order to promote cross-departmental cooperation, the company has created interdisciplinary functions – such as the position of Urs Reimann. The 42-year-old is Head of Digital Transformation at Bystronic's headquarters in Niederönz. His task is to align all areas of

"We will pass on to our customers what we learn internally during our transformation process."

Urs Reimann, Head of Digital Transformation Bystronic

the company towards digital business models. "Digitalization cannot be viewed in isolation. It permeates all departments and thus affects the entire company," Reimann says.

Together with the executive management, Reimann has developed a comprehensive digital strategy that is being anchored in the company as a whole. There is a roadmap that defines the transformation process towards becoming a full-service supplier of end-to-end solutions by 2023 – a path Bystronic is taking together with its customers: "We will pass on to our customers what we learn internally during our own transformation process," Reimann emphasizes. In the future, Bystronic will thus primarily expand its maintenance and consulting services.

Agile structures and processes

Among other things, Urs Reimann is currently working on harmonizing existing initiatives at the level of the product and organizational development with the digital strategy. He is promoting global networking and acts as an intermediary between the individual competence centers. Digitalization is changing the way people work together – interdisciplinary working groups and temporary teams are becoming more important. Not only rigid structures, but also inflexible processes must be broken up in order to be able to respond flexibly to changing market conditions in the fast-paced digital business: "Agile processes are a key success factor for the digital transformation."

In addition to these structural changes, Bystronic is striving for a change of mindset at the cultural level in order to further promote its employees' orientation towards the customers and solutions. The way of thinking should be geared towards the solution process and rigorously focused on digital business. "Digitalization requires us to think more in terms of systems and processes," Reimann says. In other words, Industry 4.0 means not only putting digital tools to clever use, but above all also a new mindset. ■

Lunch appointment with Wu Shun-Chun

Bystronic supports customers in Taiwan with the latest technologies and more recently also with an Experience Center. This benefits small and medium-sized enterprises such as Wan Yue Steel.

Text: Klaus Bardenhagen Photos: Jerry Tseng

If you have a lunch appointment with Wu Shun-Chun and the drive to Taoyuan, just outside Taiwan's capital Taipei, takes a little longer than planned, there is no need to worry. "I can eat later, it doesn't matter," the co-founder of Wan Yue Steel says on the phone. "The main thing is that my workers take their breaks on time. They are what is most important for the company." In second place, he could probably mention his machines from Bystronic. Five laser cutting systems and a bending machine are currently processing sheet metal in his factory. This year, Wu plans to purchase three or four additional machines, including the latest generation fiber laser cutting system – the first 10-kilowatt Bystar Fiber in Taiwan.

"Since our founding in 1996, I have always invested profits in new machines," Wu says. And he wants to continue investing to ensure that Wan Yue Steel remains one of northern Taiwan's largest sheet metal processing companies in the future. Walking through his factory hall, which was opened at the beginning of 2018, Wu chats with his employees about every detail of the production process – no wonder, until 2010, he regularly operated the machines himself.

From farmer's son to factory owner

Uncomplicated, hands-on, and responsible for everything, this is Wu Shun-Chun – he is a typical representative of Taiwan's sheet metal industry with its 3,000 mostly medium-sized companies. The 53-year-old embodies the economic boom during which the 23 million inhabitants of the small island worked their way up into the ranks of the world's leading economies. Today Taiwan has a GDP of approximately 600 billion dollars, which is higher than that of many much larger countries.

"My parents were farmers," Wu says. "I didn't even go to high school. I started working in a factory when I was 16." At 31, Taiwan's economy was booming, he founded Wan Yue Steel together with his brother and uncle. They still run the company together. Instead of three machines they now have 25, instead of 14 employees 100. The family-owned enterprise produces control cabinets, elevator panels, running boards, or window frames. Wu does not want to become dependent on just a few major customers, like the Taiwanese contract electronics manufacturer Foxconn is on Apple. He prefers to produce a variety of products in limited quantities for many different customers. For example kitchen equipment for the coffee specialist Starbucks and the chicken giant KFC (Kentucky Fried Chicken). Wan Yue Steel's largest production series to date were 80,000 cabinets for the state-owned energy supplier. ▶

"Since our founding in 1996, I have always invested profits in new machines."

Wu Shun-Chun, co-founder of Wan Yue Steel

More computer work:
Automation and digitalization are changing Wan Yue Steel's business.

COMPANY PROFILE Wan Yue Steel

Bystronic customer since:	2003
Founded:	1996
Fields of business:	Sheet metal for machines, construction, electronics, kitchen equipment
Business location:	Taoyuan City, Taiwan
Number of employees:	100
Production area:	10,000 m²
Revenue 2017:	USD 17 million

Experiencing Bystronic technology in action

Automation and digitalization are also changing Wan Yue Steel's business – not only because the competitors in Taiwan are rapidly catching up technologically. Wu purchased his first Bystronic laser cutting system from an agent in 2003; Bystronic established a subsidiary in Taiwan in 2011. In order to see brand-new machines in action, Wu used to have to travel to Bystronic's Swiss headquarters or to the Euroblech exhibition in Hanover, Germany. That is now also a thing of the past: In May, Bystronic opened its new Experience Center in Taiwan. Here customers can experience the latest laser cutting and bending solutions live on site, obtain advice, and take part in training courses.

Art Wang is the Managing Director of Bystronic Taiwan. During our visit in mid-May, he was rotating between technicians installing demo machines and builders carrying out the finishing touches in the Experience Center to ensure that everything was perfect for the opening with 200 customers – including Wu Shun-Chun. "Taiwan is a growth market for us," says Art Wang, catching his breath during a short break. This is why Bystronic is investing in a new business location and an Experience Center. There, customers can now experience the benefits of the new generation of machines: "More speed, higher accuracy, and greater energy efficiency." For a long time now, Bystronic has no longer been just a supplier of machines but supports its customers as a full-service provider. "Customers want to know what it means to choose Bystronic as their technology and service partner. This is what we demonstrate here."

Continuous modernization:
The company has been relying on Bystronic machines since 2003.

Sights set on overseas markets

As Bystronic's particular strengths, Wang emphasizes the seamless software and a uniform operating concept, be it for laser cutting, bending, or automation. "Frequently, the first question is: Our employees have got used to the old machines. If we change manufacturer, will they be able to come to terms with the new systems? But our operator interfaces are so user-friendly that this is never a problem." That also applies to the language selection: Almost one third of the workforce in Taiwan's sheet metal industry are foreign workers, for example from Vietnam or Indonesia. Even if they speak Chinese, they frequently only have a cursory understanding of the characters. "Our customers can easily change the display language at any time," Wang explains. "And naturally, we will continually update the software."

The concept convinced Wu Shun-Chun. After the laser cutting systems, he now also wants to replace his bending machines with Bystronic press brakes. He intends to pass on the savings resulting from the productivity gains to his customers and achieve his next goal: Opening up overseas markets so that Wan Yue Steel can also start exporting to Europe or America. This explains why the entire third floor of Wan Yue Steel's brand-new office building is still empty: "You always have to plan a little bigger and leave room for growth," says Wu – and asks the waitress for a side-order. ■

"Customers want to learn about the advantages of choosing Bystronic."

Art Wang, Managing Director Bystronic Taiwan

EXPERIENCE CENTER

With Taiwan, Bystronic now has an Experience Center at all its Asian subsidiaries. The generous shop floor offers sufficient space for two bending machines and a 10-kilowatt ByStar Fiber.
Be it during demonstrations, training courses, or consulting discussions – in the Experience Center interested parties obtain all the information they need about the new machines. This is a great advantage and also gives the customers confidence when they start their own production.

Only days to go until the opening:
Final touches to the Taiwan Experience Center

Innovation à la Québécoise

Bonjour Quebec: The Canadian province is a picturesque spot in already scenic Canada – and surprises with a strong spirit of innovation in the technology and manufacturing sector. As a specialist for sheet metal processing solutions, Bystronic fits in perfectly there.

Text: Manuela Imre Photos: Dario Ayala

Every morning at half past seven, the rumbling of his heavy Suzuki machine already announces Sylvain Piché's arrival from afar. "A touch of rocker style is never out of place – even in tranquil Plessisville," says the 49-year-old with a smile. The technical director and co-owner of EPP Metal is obviously very much at home here on the doorstep of Quebec City. From the small Canadian town with some 6,700 inhabitants it is only 95 kilometers to Quebec City, Montreal is about twice as far. "The perfect distance," Piché says. "The cities offer a rich cultural and gastronomic life, and out here, we can enjoy peace and nature."

The province of Quebec is Canada's francophone stronghold. French is the official language, English only plays a minor role. Sylvain Piché was born here. More than ten years ago, together with his partners Guy Coté and Karine Gouin, he took over the medium-sized company EPP Metal from his father. Today they have almost 50 employees – but it all began as a one-man business in the garage of Sylvain Piché's father.

Paul Piché started processing copper and metal in the 1970s. Step by step he expanded the company. Today, EPP Metal produces series components made of sheet steel, aluminum, or stainless steel. For switchgear cabinets, for example, they manufacture doors, side elements, or back panels. The company's concept: Turnkey products from a single source, and their portfolio is not limited to metal.

QUEBEC FACTS

Quebec City is Canada's oldest French-speaking city and was declared a World Heritage Site by UNESCO in 1985. In 2018, the capital of the province of the same name on the St. Lawrence River will celebrate its 410th anniversary. Thanks to its hilly city center, winding cobblestone streets, and a vibrant cultural and gastronomic life, it is one of Canada's most popular tourist destinations. Besides maple syrup, poutine is Quebec's culinary specialty, although it takes some getting used to: French fries with cheese curds and drenched in gravy.

"Communication, customer service, and reliable maintenance are important."

Sylvain Piché, Technical Director and co-owner of EPP Metal

In jeans and chucks: *Sylvain Piché in the production halls of EPP.*

A perfect marriage

"Growth is good, but not too fast", Sylvain Piché sums up the strategy of EPP Metal. "We want to remain a family business with a manageable size; that is our strength." High quality, high reliability, high precision, high speed – these are the demands that Canadians place on themselves and on their work. Bystronic is the perfect partner for this. "Process monitoring and quality control virtually in real time provide us with the reliability and confidence we need," says the company director as he walks through the production halls in jeans and chucks.

The factory boasts two Bystronic Xpert press brakes, one version with 180 tons and the other with 320 tons bending force, a 100-ton Xact press brake, and a 3-kilowatt and a 4-kilowatt fiber laser cutting system. Piché determines on a case-by-case basis which laser system is more energy-efficient for the job at hand. The underlying goal is clear: save costs.

Automated cutting, bending, and material handling have made EPP Metal's workflows faster and more efficient. "It's a real luxury not to have to worry about these processes," Piché says. "But communication, service, and reliable maintenance are also important. For us it has been a close, personal partnership right from the start. In a sense, one marries into the Bystronic family," says Piché with a smile. "And our marriage is perfect."

Full digitalization as a long-term objective

The Canadian entrepreneur is particularly impressed by the BySoft 7 CAD process software, "because it enables us to program the press brakes from the office and transfer the bending programs to the appropriate bending machines in the production hall with just a click of the mouse". The cutting programs for the laser cutting machines are also created using BySoft7. Tommy Tousignant, who has been operating laser cutting machines at EPP for ten years, gives a thumbs-up with a "très bien!". "The operation is simple, the software is reliable. The parts that come out of the machine are perfect."

Sylvain Piché intends to further simplify the workflows. "We have always tried to stay up-to-date with new technologies. This is one of the factors that sets us apart from our competitors." The next step that is being considered is the implementation of fully-automated, digital solutions for laser cutting and bending: "Our goal is full digitalization."

COMPANY PROFILE EPP Metal

Bystronic customer since:	2008
Founded:	1983
Fields of business:	Specialized in the production of metal components in all varieties and with a high degree of complexity
Business location:	Plessisville, Quebec
Number of employees:	47
Production area:	2,322 m^2

Glancing over the Atlantic

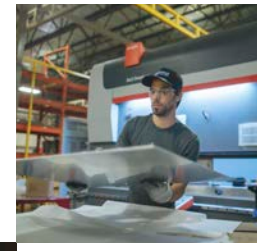
The great interest of many Canadian companies in new technologies and their willingness to invest in them in order to modernize their production processes are a sign of the strength of the local market, explains Robert Nicoli, Managing Director of Bystronic Canada. Even if Canada is struggling with an unfavorable exchange rate against the US dollar and the uncertainty regarding the political goals of the current US administration.

"Nevertheless, the Canadian manufacturing market has been very dynamic in recent years, and we are experiencing a growth trend in 2018," says Nicoli. "Canadian customers follow European influences more closely than those in the US and are actively seeking innovative technologies that reduce their operating costs and enhance productivity."

Piché can only confirm this. "We want to increase our productivity without sacrificing efficiency." EPP Metal currently works together with approximately 50 customers, including some that require large series of up to 1,000 parts, although most order batch sizes are in the 50s. "We prefer to concentrate on manageable projects and remain local." Most of the customers are French-Canadian from the surrounding area, from time to time an order comes from the neighboring province of Ontario. "This is just the way we want it to be," says Piché, with a slightly embarrassed smile. "I suppose that's a Québécois peculiarity, too. We're always looking to set ourselves apart from the rest of the country." ■

"Process monitoring and quality control virtually in real time provide us with the reliability and confidence we need."

Sylvain Piché, Technical Director and co-owner of EPP Metal



Precision and reliability: *Bystronic's technology satisfies the high demands of the family enterprise.*

Cutting in the third dimension

From 2D to 3D – Bystronic is expanding its portfolio with solutions for laser-assisted tube and profile processing. The expertise for this step is supplied by a pioneer in this field: t he Italian subsidiary TTM Laser.

Text: Ivan Carvalho Photos: Stefan Jermann

Brescia may not enjoy the name recognition abroad of its nearby neighbor and rival Milan, the hub of Italian fashion, finance, and furniture design, yet the city has the distinction of being home to specialist producers that are leaders in their respective industries.

Some, like the winemakers in the province of Brescia that produce Franciacorta, Italy's premier sparkling wine, can look back on centuries of history. Then there is the technological success story of TTM Laser. Founded in 2001, the relative newcomer made its name developing state-of-the-art 2D and 3D laser systems for the cutting of tubes and profiles made of materials such as stainless steel, aluminum, and copper.

The company's growing prosperity is already evident when one arrives at its shiny glass-and-steel headquarters that opened opened in 2017, which boasts which boasts a 7,000 m² factory hall where the laser cutting systems are assembled. Stefano Dal Lago, TTM Laser Sales Director, recognized the company's potential at an early stage. Dal Lago, who has a background in mechanical engineering and who previously worked for two decades with waterjet cutting systems, joined the company in 2015 after having being captivated by the company's technology during a product demonstration. "I came away very impressed by their highly motivated team and their engineering know-how," Dal Lago recalls.

Greater design freedom

The technologies developed by TTM Laser for the cutting of tubes and profiles can be applied in a wide spectrum of industries ranging from producers of furniture and exercise machines that value the high precision to the automotive and agricultural machinery sectors, where tubes and profiles provide the rigidity necessary for chassis construction. Dal Lago adds: "Our machines open up new design possibilities, as designers benefit from the ability to create flexible contours and simple joins as well as to reduce the need for welding and increase accuracy when it comes to repetitive tasks." ▶

"Our machines open up new design possibilities."

Stefano Dal Lago, Sales Director TTM Laser

COMPANY PROFILE TTM Laser

Founded:	2001
Business location:	Cazzago San Martino, Italy
Number of employees:	47
Production area:	7,000 m²
Experience Center:	3,200 m²
Applications:	TTM Laser machines are used in a variety of sectors, including the automotive, agricultural machinery, furniture, fitness equipment, crane engineering, and construction industries.

The mechanical engineers: *Andrea Bodini, Nicola Palola, and Aronne Marcandelli (from left to right) in their modern offices.*

To emphasize his point, Dal Lago motions to the architectural design of the company's headquarters, gesturing to the walls and window frames in his office. The building's facade incorporates steel beams that were cut and joined to construct a frame, while a visit to the factory hall reveals a tubular steel roof truss design made using the TTM Laser's own machines.
Indeed, architecture is a field where TTM Laser expects to see increased interest in the near future. The year Dal Lago joined the company, it was in the spotlight thanks to EXPO 2015, the food-themed world's fair hosted in nearby Milan where the futuristic Italy Pavilion showed off impressive steel profiles that were built using TTM Laser technology. "This was a great calling card for us, as it was the centerpiece of the world's fair," Dal Lago says.

Growing demand around the globe

There are plenty more examples of innovative building designs where TTM Laser's machines have lent a helping hand, including the silky curves of the Skyway Monte Bianco cable car station in the Alps. Dal Lago's colleague, TTM Laser COO Andrea Guerra, who envisions a rosy future ahead for the brand in the construction sector, shares his optimism: "Our success in this field will require a change of mindset by showing people the possibilities offered by laser cutting. In the construction sector, many engineers still rely on conventional cutting methods."

Both Dal Lago and Guerra refer to the growing need for high precision when cutting tubes, and industry forecasts back them up: The demand for laser-based tube cutting machines is expected to grow by 10 percent per year in the next decade. TTM Laser machines offer an attractive option as they are able to produce extremely accurate, complex laser-cut geometries with round, square, rectangular, and oval tubular materials as well as wide flange beams and open profiles.

TTM Laser's machines process tubes with diameters ranging from 12 mm to 815 mm, and with its FL 170 3D model, the company was the first in the industry to introduce a 3D laser tube cutting machine equipped with fiber laser technology, which translates into faster cutting speeds and three times the energy efficiency compared to a CO_2 laser along with a noticeable reduction of maintenance costs.

Head of Development Andrea Guerra: *In the state-of-the-art production halls of TTM Laser in Brescia, which were built using the company's own technologies.*

EXPERT TIP

Stefano Dal Lago
Sales Director TTM Laser

What are the advantages of laser-assisted tube and profile cutting?

"Compared to conventional cutting methods, laser-based tube cutting technology is more precise and requires less energy. It offers the possibility to implement complex designs and a significant reduction in production costs by largely eliminating the need for subsequent machining tasks. Depending on the thickness and diameter of the metal tubes, it is possible to achieve a 50 percent reduction in costs and a 50 percent reduction in processing time."

A fruitful partnership

As interest in 3D laser cutting of tubes and open sections has continued to grow, TTM Laser has worked to expand its customer base beyond continental Europe to places as far away as Utah in the United States and Freemantle, Australia, with enquiries coming in from job shops and OEM customers ranging from railway operators to shipyards.

In 2017, in order to convince more customers of its solutions, TTM Laser was on the look-out for a partner to expand its market reach. Bystronic proved to be the best choice, and in 2017, the two companies entered into a partnership entailing joint sales activities, which began at last year's Blechexpo trade fair in Stuttgart. For Dal Lago, this was a key moment for the company: "It opened up new opportunities. We could now rely on Bystronic's extensive network and draw the attention of many potential customers that were previously not familiar with us."

On markets such as North America, where Bystronic can assist with an extensive after-sales service team, it is now easier to gain access to customers and forge lasting relationships. The two companies quickly moved ahead with their fruitful alliance, and this spring, both sides agreed that the next logical step would be for Bystronic to acquire the Italian manufacturer. One of the first decisions taken was to create an Experience Center similar to those that exist at an increasing number of Bystronic locations worldwide, in order to enable potential customers to demo machines and gain hands-on experience with TTM Laser's range of products with an expert on hand.

"It is still early days for laser technology in our field of business. The sky's the limit."

Stefano Dal Lago, Sales Director TTM Laser

Today, as the young company writes the next chapter of its history, the mood in the corridors and on the factory floor is buoyant. There is a buzz of activity with staff energized by new orders coming in from the United States and with companies in Asia eager to try out TTM Laser machines. "It is still early days for this technology in our field of business, but the sky's the limit," Dal Lago says. "With Bystronic onboard, we have the added fuel to take our business to the next level." ■

The sales team: *Stefano Bordini, Erika Carbone, and Davide Rebessi (from left to right).*

Final assembly: *Before the systems leave the production halls, they are put through rigorous tests..*

The superuser generation

The Bühler Group is pushing ahead with the digitalization of its production processes. The modernization of the Appenzell plant using Bystronic technology is not only increasing efficiency, it is also attracting the young generation of machine operators.

Text: Joel Bedetti Photos: Stefan Jermann

The Bühler Group's Appenzell plant is creating jobs for digital natives. This is hardly surprising: Founded in 1860, the family-owned company has always distinguished itself by staying ahead of its competitors in terms of innovation and by conquering new markets with innovative products. The Bühler Group is the market leader in many sectors: All around the globe, their technologies are used for food processing in mills, chocolate factories, or breweries. Every day, their solutions ensure a healthy and safe diet for two billion people and help provide mobility to one billion people. Recently, they also successfully opened up new fields of technology, for example with equipment for waffle production and with battery manufacturing solutions.

The Bühler Group is driving innovation ahead not only with new products, but also with the digitalization of its production processes. Since the beginning of 2018, when the entire sheet metal processing was completely modernized, the Appenzell plant is one of the Group's flagship business locations. While the company's main plant in the nearby municipality of Uzwil concentrates on series production, special parts are manufactured in Appenzell, for example spare parts for older models that are no longer produced in series. As a result, the 80 employees are used to a high degree of flexibility and were able to quickly familiarize themselves with the new bending machines and the automated storage, cutting, and sorting system. ▸

COMPANY PROFILE Bühler Group

Fields of business:	Leading technology supplier for the food and mobility sectors
Founded:	1860
Employees:	Approximately 11,000
Revenue 2017:	CHF 2.69 billion
Active in:	140 countries

***Teamwork:** Werner Schmid and Christoph Neff at the new bending machine*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"My job used to be physically very challenging. Now mental tasks are more important."

Maurus Koller, "superuser" for the new laser cutting and sorting system

Bühler Group

All-round automation for cutting

"My job used to be physically very challenging," Maurus Koller says. His work frequently involved welding, his job was tough. "Now mental tasks are more important." The 30-year-old plant and equipment technician is the "superuser" for the new laser cutting and sorting system at the Bühler plant in Appenzell. The new tool in Koller's toolbox: the mouse. Using drag-and-drop on the screen, he distributes sheet metal parts from the ByStar Fiber 4020 laser cutting system onto the awaiting pallets. The automatic handling and sorting system executes his instructions. "Here I see first-hand what I am learning during my studies", says Koller, who is continuing his education as a mechanical engineering technician, referring here to the digitalization of the industry.

For the digitalization of the cutting processes, Bystronic opted for an individually customized end-to-end solution. The key feature: the combination of Bystronic technology with third-party machines. For example, the handling and sorting system was supplied by the Bystronic subsidiary FMG. It functions fully automatically: A robotic arm uses vacuum suction cups to pull metal sheets from the extended cassettes of the FMG high-bay storage system, which had already been installed a few years previously.

EXPERT TIP

Thomas Huwyler
VP Global Key Account Management

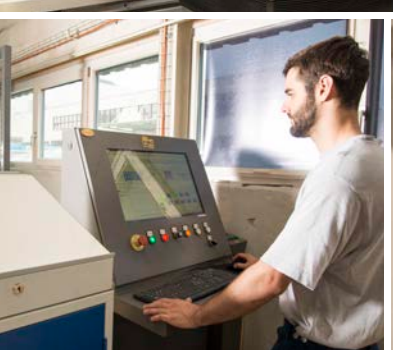
"In the Bühler Group's new machine pool, Bystronic technologies were combined with systems from third-party suppliers and expanded with custom-made special solutions. Our subsidiary FMG developed the inkjet printer and the thread-cutting portal for the sorting system. While there used to be different partners for each system component, today there is only one: Whenever Bühler's plant in Appenzell needs support, it can simply dial a single telephone number. Then Bystronic takes over."

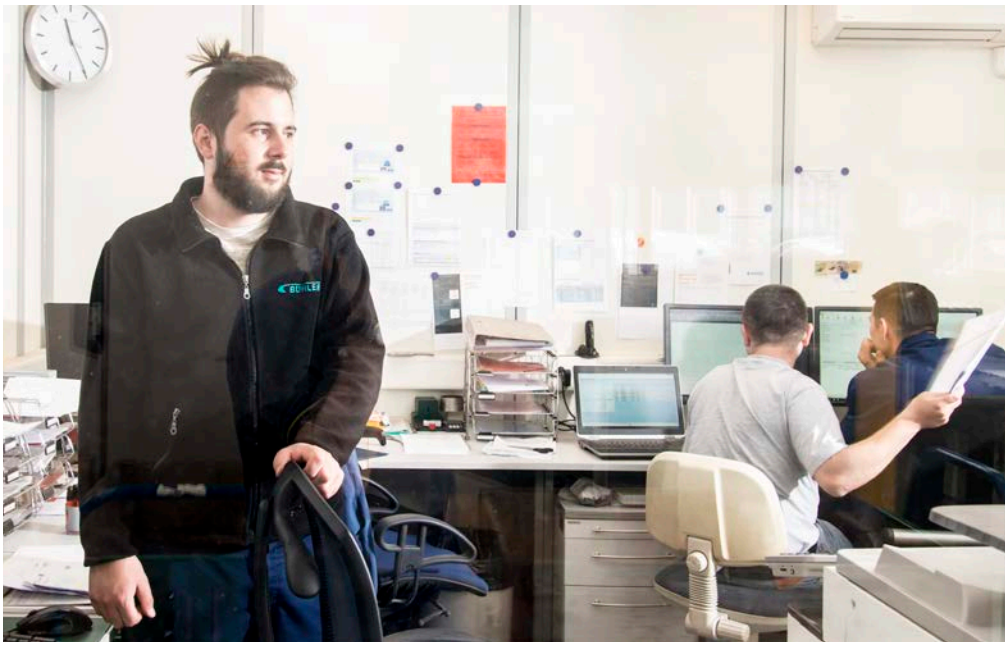
An inkjet printer that was integrated into the system especially for the Bühler Group marks the planned sheet metal parts on the metal sheet with a bar code before they are cut. This will enable the production documentation to be digitalized. Currently, each sheet metal part is accompanied through the production process by an order sheet. In future, employees will be able to register processing steps directly on the part simply by scanning the bar code.

For parts that will be screwed together later, a portal on the handling and sorting system, which was also custom-made for Bühler, cuts threads before the parts are cut. During the subsequent cutting process, the laser cutting system takes the resulting bending allowances into account. After cutting, the system places the sheet metal parts on the designated pallets, which are then sent to the next work stations. The handling portal disposes of the residual sheets in a skip. After the laser, a deburring machine from Ernst removes any irregularities on the edges of the sheet metal that occur during cutting – a job that Bühler employees used to perform manually.

Offline programming optimizes bending process

The bending department has also been thoroughly modernized. Four older models were replaced with three latest-generation Bystronic press brakes: an Xpert 320, an Xpert 150, and an Xpert 40. The automatic tool changer in the Xpert 150 speeds up the changeover times. Bending aids support the operator with the stabilization of large sheet metal parts. Thanks to these technologies, the two smaller press brakes are now operated by one employee instead of two.





Offline programmer Mike Zwissler *now works in the office instead of at the bending machines.*

Instead of at a press brake, Mike Zwissler now sits in front of a screen. The 28-year-old has completed further training to become an offline programmer. He rotates and turns the 3D model of a complex sheet metal part, viewing it from all sides. Then, with just a few clicks, he simulates the bending sequence that the Xpert will perform. If the programmed sequence would result in jamming, an error message would appear. "In the past, we had to run through the bending sequence in our heads," Zwissler explains, "and we would only realize that it didn't work when it was on the machine". Now he uses the BySoft 7 software to feed jobs into the press brakes, and while his colleagues execute them, he can already start programming the next jobs. This not only minimizes non-productive time – it also improves the precision compared to the manual input of data. "Input errors are definitively a thing of the past," Zwissler says.

Impressive speed

Work has also become more efficient and interesting for the team in charge of the automated storage, cutting, and sorting area. The system is now controlled by only one employee per shift. "Initially the robotic arm of the handling and sorting system seemed so fast to us that we started carefully at 70 percent and gradually increased the speed," says the "superuser" Maurus Koller. "In the meantime, we have grown accustomed to the new pace." ■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