

TRUf

THE MAGAZINE FOR SHEET METAL EXPERTS

01 Galocan

On a growth path: how an office-supplies manufacturer transformed itself into a high-tech business

02 Las Vegas

The joy of storytelling: how social media is helping a service provider attract new customers

18# 2023 FOCUS

03 Birżebbuġa

Smart factory: why investing in digitally connected, zero-emission manufacturing pays off

04 Ditzingen

Hand in hand: how outstanding industrial architecture on the TRUMPF campus has helped build a successful business

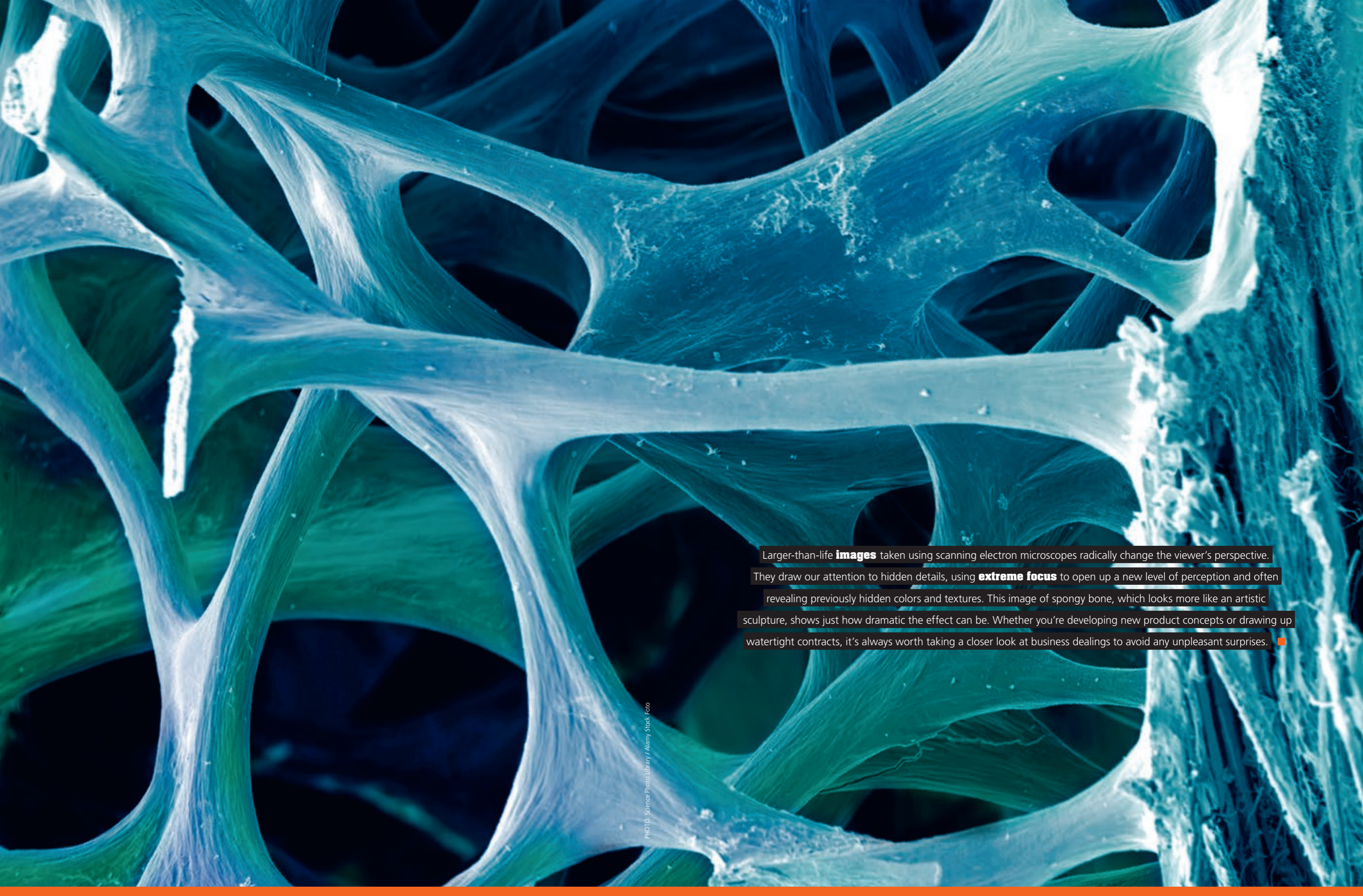


With graceful, practiced steps, ballet dancers venture bravely into a billowing sea of turns and rotations. Focusing on a fixed point in space is often critical, especially when it comes to doing pirouettes. If the dancer is not securely anchored, they might falter and lose their balance. Far from being confined to the stage, **the art of maintaining balance** also applies to business. In a world full of twists and turns, entrepreneurs must set their own fixed points in order to hold a steady course and prevent their business from faltering. As choreographers of their own success, they create a vision and set clear objectives to avoid losing **focus.** ■



Staying on top of things in today's fast paced world is a Herculean task. It can sometimes feel like playing a hidden-object puzzle game, with hundreds of little stories just waiting to be discovered. To understand the broader context while also spotting crucial details, we need to get a balance between keeping our distance and getting close to the action. It's all about **seeing the big picture** while ensuring that **even the tiniest things don't escape our attention**. Take the time to let your **focus** wander and you will constantly make new discoveries. This can be a useful exercise in both our professional and private lives. See if you can find five instances of the word TRUMPF in the picture. Check out the solution on the back page if you get stuck! ■

PHOTO: Christoph Hoppe/Anrock



Larger-than-life **images** taken using scanning electron microscopes radically change the viewer's perspective. They draw our attention to hidden details, using **extreme focus** to open up a new level of perception and often revealing previously hidden colors and textures. This image of spongy bone, which looks more like an artistic sculpture, shows just how dramatic the effect can be. Whether you're developing new product concepts or drawing up watertight contracts, it's always worth taking a closer look at business dealings to avoid any unpleasant surprises. ■

PHOTO: Science Photo Library / Alamy Stock Foto

The future in **focus**



Dear Readers,

This year marks TRUMPF's 100th anniversary. Founded in a garage in 1923, we have successfully transformed our company into a market and technology leader in the field of machine tools for flexible sheet-metal fabrication. In August, we celebrated this milestone achievement at our Ditzingen headquarters by firing a bright-green laser ten kilometers into the sky. Heralded by the media as the world's longest birthday candle, it was visible up to 80 kilometers away. This remarkable display was not only dedicated to the 5,800 employees at our main site, but also to their families in the local area, our partners and customers, and the general public (p. 35). As we move into our next 100 years, we will reflect on how making the right decisions enabled us to reach this centenary year. But most of our focus will be on the customers that helped us get here.

What has changed over the past century, and where might technology take us in the future? As the computing power of industrial computers increases, exciting new opportunities are opening up for automation and digital connectivity. Even artificial intelligence is now being put to good use by sheet-metal fabricators. Turn to page 17 to discover some of the smart-factory solutions that can help you get started in automated manufacturing. You will soon see that even simple connectivity technologies can provide a major productivity boost.

Industrial robots have already mastered the art of picking up parts and sorting them into the correct places. On page 40, we take a look at what additional skills they might pick up in the

future. Our new laser-blanking system also relies on a high degree of automation. It can automatically cut parts from sheet-metal coil stock weighing up to 25 metric tons. Robots are then used to sort the finished parts. This is a game-changer for any company looking to achieve fast, high-volume production (p. 36).

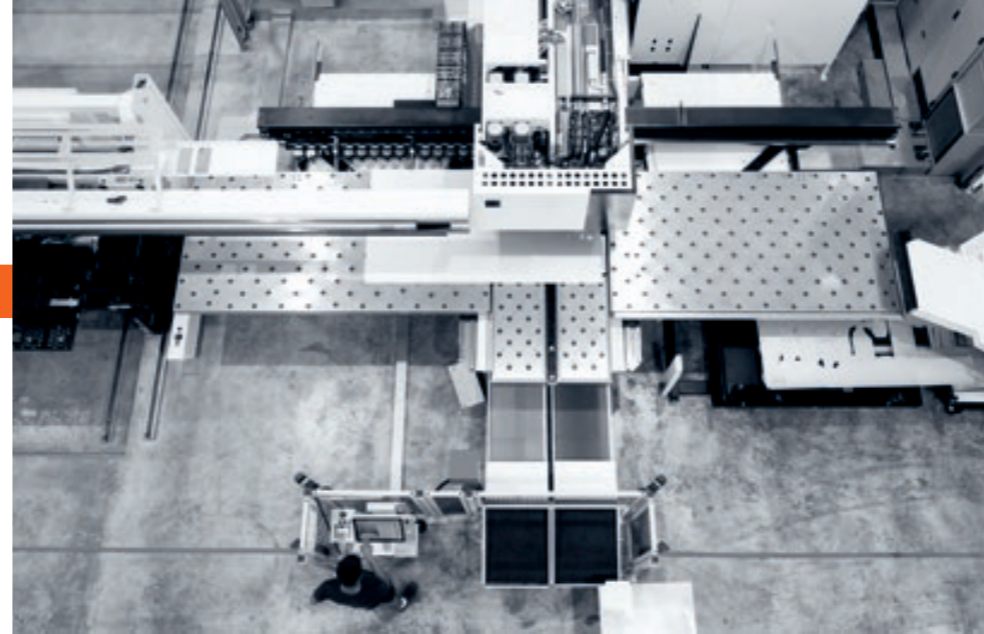
Digital connectivity is also a great way for companies to boost their sustainability credentials. Maltese company Seifert Systems decided to work with TRUMPF on creating a zero-emission smart factory with the goal of achieving a fourfold increase in productivity (p. 22). Software from TRUMPF is also helping Filipino company Cherimel speed up the manufacturing of a wide assortment of parts. They can now move from an initial drawing to a finished prototype in a matter of days – even for small batch sizes (p. 12).

The only way to stay focused is by constantly evolving. Fortunately, TRUMPF is on hand to provide the solutions you need for your sheet-metal process chain – both now and in the future.

I hope you enjoy reading this issue!

DR.-ING. STEPHAN MAYER
CEO Machine Tools and Member of the Management Board

TRU^e
 Contents
 #18/2023
FOCUS ...



BIZ+
SHORT CUTS
 34

02
 Page
18
 ... on Las Vegas

Can you really turn tube processing with TRUMPF laser machines into a hit on Instagram and YouTube? Absolutely! Jordan Yost realized from day one that digital marketing was critical for his job shop Precision Tube Laser. By focusing on social media, he has built an impressive international community.



03
 Page
22
 ... on Birżebbuġa

Seifert Systems makes air-conditioning units for control cabinets on the island of Malta. The company's products protect the complex and sensitive electronics used in wind turbines and mobile-phone masts all around the world. Software from TRUMPF monitors Seifert's machines and processes and organizes the highly automated production facility.

TEC+
SHORT CUTS
 44

04
 Page
30
 ... on Ditzingen

From the innovation campus and education center to the staff restaurant, many of TRUMPF's buildings exhibit the perfect blend of design and function. Credit goes to the Berlin-based architecture firm Barkow Leibinger.



Editorial 08

01 Tapping into new opportunities 12

02 Tube fabrication conquers social media 18

03 Mediterranean efficiency 22

04 Where innovations thrive 30

BIZ+ shortcuts 34

Laser cutting from the coil 36

Infographic: Flex Cell – the world's fastest mobile bending cell 38

05 Kevin: alone in the lab 40

TEC+ shortcuts 44

Hoedtke: a company you can rely on 46

Smart savings: TRUMPF part design 48

pARTgallery 49

Column 50



PHOTOS: Lee Santiago

01

PHILIPPINES

Focus on Caloocan

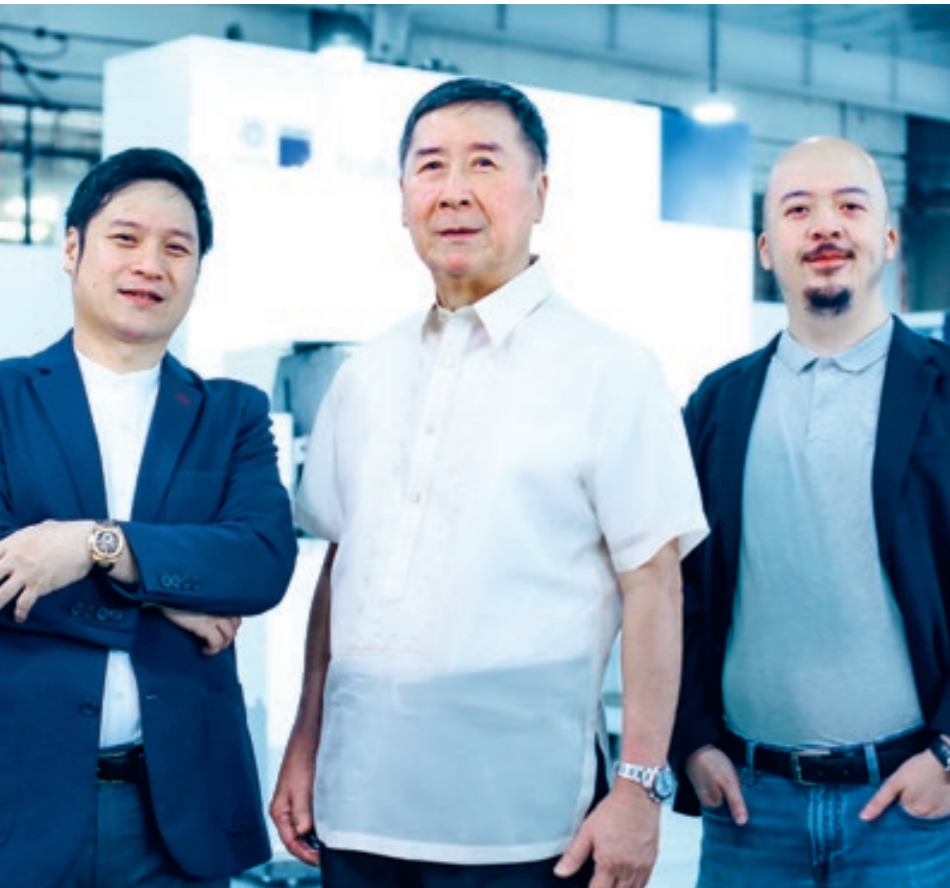
TAPPING INTO NEW OPPORTUNITIES

In the 1950s, a small **Filipino family business** made a name for itself as a manufacturer of office supplies. From paper clips and staples to loose-leaf folders, typewriter ribbons, ring binders and metal file clips, Cherimel produced everything its customers needed. Since then, the company has expanded and taken its **capabilities** to a whole new level.

Today, Cherimel's broad array of services includes manufacturing armor for vehicles, bending panels into shape for cabinets and kiosks, laser-cutting motorcycle parts, fabricating tailor-made metal tanks, punching sheets for designer cladding, and much more besides. The company has even made inroads into the aerospace industry. Whatever its customers need, Cherimel is on hand to help. All thanks to technology from TRUMPF – and a corporate culture that isn't afraid to experiment.

The moment you enter the parking lot, you can see that Cherimel Philippines Inc. is on a growth trajectory. The rows of cars neatly lined up in front of the four-meter-high metal gates to the production facility show that many employees are already at work. Cherimel is headquartered in Caloocan, a city in the northern metropolitan area of Manila, the capital of the Philippines. Tall trees sway over the outer walls of the company's premises and lush greenery fills the open spaces between buildings. Around the company's nameplate is a latticework of planter boxes containing ferns, palms and other plants, an attractive piece of metalwork that Nathaniel and Andrew Cu fabricated themselves. "That was our very first laser, a three-kilowatt machine," says Nathaniel Cu,

Through the generations: Jeffrey Cu (center) and his sons Nathaniel (left) and Andrew are guiding Cherimel into a successful future.



pointing to a TruLaser 3030 just beyond the metal gates. This laser heralded Cherimel's transformation into a high-tech company that can handle just about any metalworking job – and the beginning of TRUMPF's involvement in the Filipino market.

Named after the founder's daughters

Nathaniel and Andrew Cu are the third generation of their family to run Cherimel. They have been at the helm since 2010, and their father, Jeffrey Cu, has been company president since 1994. But Cherimel's origins stretch all the way back to 1950, when Cherimel Manufacturing Corp. was founded by their grandfather, Paul Eiaw. It wasn't until Jeffrey took over in 1994 that he changed the company's name to Cherimel Philippines Inc., retaining the first-word combination of the names of his father-in-law's daughters, Cherrie and Nellie. "Our grandfather decided not to correct the mistake made by the registration authorities, who had mistakenly written the 'n' as an 'm'," says Nathaniel Cu.

Over the years, each generation of the family has left its own mark on the company. Nathaniel and Andrew's grandfather was perhaps best known for being the first person in the world to manufacture paper clips, and for fabricating the intricate metal legs of old Singer sewing machines. But he also enjoyed making his own car jacks. "Our grandfather loved producing things that nobody

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 "Our grandfather loved **producing things** that **nobody** else wanted to make."

Nathaniel Cu, CEO Cherimel Philippines Inc.

else wanted to make," recalls Nathaniel. He also fabricated the first stamped sheet-metal parts for the motorcycle industry, including the metal plates showing the vehicle identification number and model name. Their father, Jeffrey Cu, subsequently took the business to the next level, moving its headquarters to new premises in Caloocan in the early 2000s and expanding its portfolio to include customers from the automotive industry.

"Cherimel gets the job done" is the company motto – a sign of how hard they work to meet their customers' needs. Instead of focusing on a specific industry or product group, the Cu family opted to remain as agile and versatile as possible and to concentrate on growth. Today, the company

PHOTOS: Lee Santiago



Partnership: TRUMPF has spent eight years supporting Cherimel's transformation into a high-tech company.

employs 90 people, up from fewer than 30 when Jeffrey took over in 1994. "When I took the helm, my goal was to build a high-tech fabrication business," says Nathaniel. At that point, Cherimel could bend and punch sheet metal, but they couldn't cut it. "We were struggling to meet some of our customers' wishes, so we clearly needed a laser," says Nathaniel. He ordered a TruLaser 3030 in 2015, and the machine cut its first sheet-metal parts in January 2016. This coincided with a decline in demand for punched products, so it was perfect time to fundamentally reorganize the company's production processes.

A pioneering sector in the Philippines

In the early 2000s, TRUMPF still had no access to the Filipino market, and many local companies were working with other manufacturers. TRUMPF didn't yet have a team of service technicians in the country, and the German high-tech company wasn't even on Cherimel's radar. Today, things are very different. A green corridor winds its way through the 5,000-square-meter production facility, taking us past metal cabinets ready for shipment, ATM housings, and yellow-and-red display cases for a famous fast-food company. The machines are neatly arranged between the finished products: three TruLaser 3030s with three, six and ten kilowatts of power,

Growth: With its young, dynamic team, Cherimel offers a comprehensive range of services in the Philippines.





Progress: From laser technology to punching, Cherimel can fulfill even the most demanding customer requirements.

two TruPunch 5000s, the TruBend Center 5030, a TruBend 3100 and a TruBend 7036. TRUMPF is also due to deliver a TruBend 5170 in February 2024.

Over an eight-year period, Cherimel added a new TRUMPF machine each year. This steady transformation into a high-tech company has enabled it to take on more complex jobs. While their grandfather manufactured products for the motorcycle industry and their father focused on the automotive industry, the two Cu sons are now focused on tapping into new markets. As an ISO and AS certified company, Cherimel is ideally positioned to serve the aerospace industry. As well as producing parts for truck chassis, its modern facility also manufactures body parts. But with so many bases to cover, space is getting tight

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“ Digitalization is the key to even greater efficiency. ”
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Nathaniel Cu, CEO Cherimel Philippines Inc.

Next step: the smart factory

The Cu brothers next goal is to make the transition to a smart factory. “Digitalization is the key to even greater efficiency,” says Nathaniel. “Our vision is to create an efficient, paperless system for our suppliers and customers.” Once again, TRUMPF has come up trumps with its Oseon software, which helps users take the next step toward fully automated sheet-metal processing. “We want to build an agile company with unlimited capabilities that makes even more efficient use of resources. That will enable us to offer customers an even more sustainable production process,” says Nathaniel.

Andrew and Nathaniel’s father was an electrical engineer with a vision, someone who believed in sustainable products that could be recycled and reused. The two brothers are determined to continue that vision, the essence of which their father captured in the company logo. This hangs amid the planter boxes at the entrance to the production hall. Cut out of sheet metal, it shows a gear wheel with a heart in the middle, protected by a ring of nine sunbeams. In religion and mythology, the number nine stands for completion and fulfillment. A fitting choice for Cherimel, which has built its success on its ability to get the job done.

Digitalization: The company’s next step is to make the transition to a smart factory.

PHOTOS: Lee Santiago



01

A closer look:

Smart factory solutions

A TruLaser 3030 fiber helped **Cherimel Philippines Inc.** transform itself into a high-tech company. Oseon and TruTops Boost are the next steps on the company’s **journey to a smart factory.** The road might sometimes seem long, but it needn’t be difficult. Even small-scale manufacturing can be smart if you take the right approach.



In brief

Start simple – first steps toward a smart factory

Every production line is different – and every company follows a different path to a smart factory. At the heart of this journey are **machines that are specifically designed for connectivity**. As well as offering solutions for fully connected manufacturing, TRUMPF also supports companies that are entering the world of smart manufacturing for the first time. The basic goal of a smart factory is to **increase transparency and identify potential for optimization**. This alone can alleviate many of the problems that companies typically face. TRUMPF solutions offer a step-by-step approach to setting up a smart factory – because every journey has to **start somewhere!** Here, we explore that approach based on the example of a laser-cutting machine.

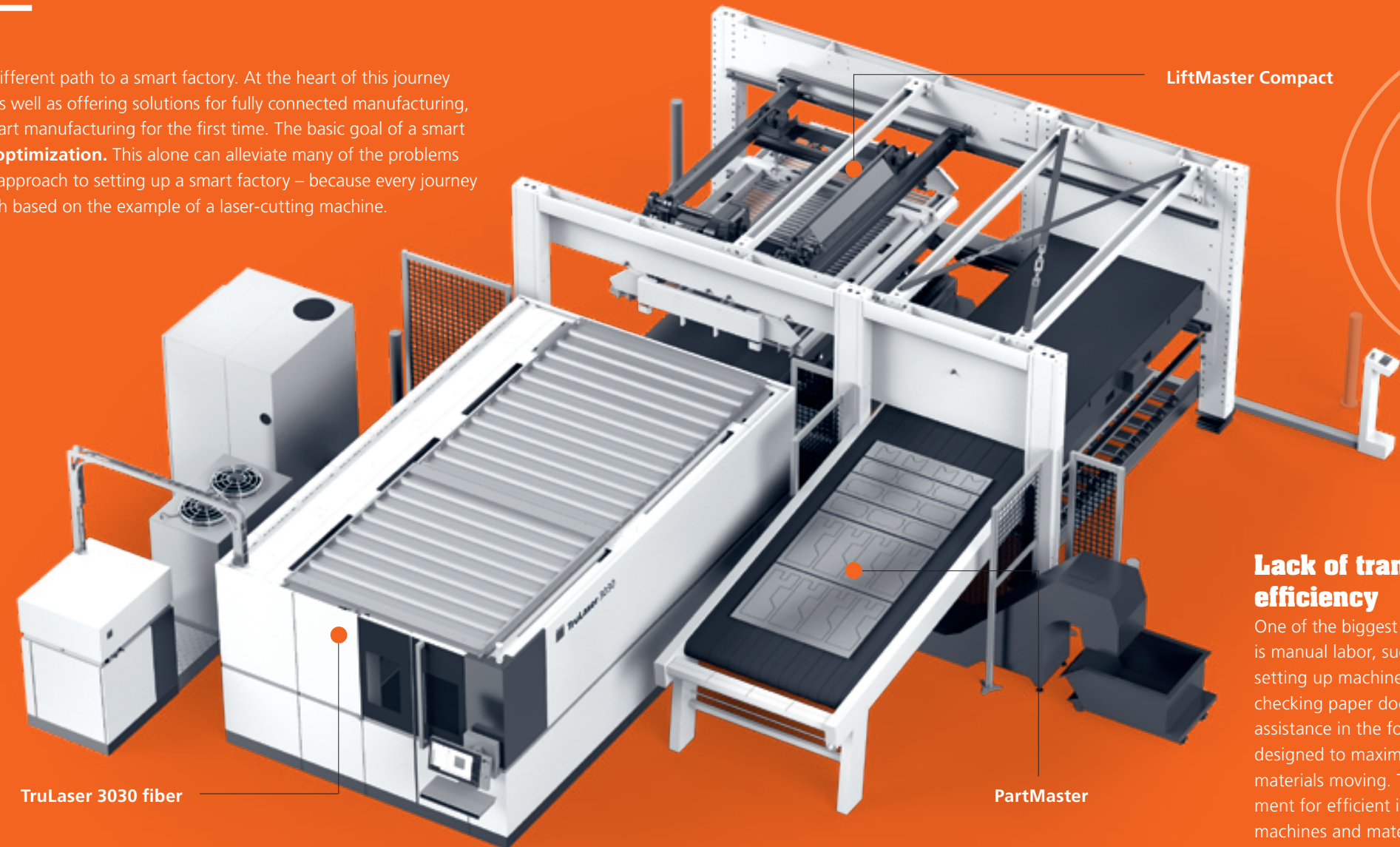
The **TruLaser 3030 fiber** 2D laser-cutting machine is a multi-purpose system that caters to a wide range of cutting tasks and sheet thicknesses. In this example, the machine is hooked up to a **LiftMaster Compact loading/unloading unit**. This dynamic and versatile automation set-up is a great solution for fast sheet-metal processing, regardless of whether it is connected to a storage system. Compact and space-saving, its rapid cycle times cut costs and speed up production. The **PartMaster sorting station** completes the trio of machines in this example, which shows just how easy it is to take the first modest steps toward a smart factory.

Degree of automation



Shortage of skilled workers

Finding skilled workers is tough in any industry, and sheet-metal fabrication is no exception. One solution is to use automated processes and Oseon production control software, as well as training up existing staff. Coordinated manufacturing solutions ensure that the quality remains the same regardless of who operates the machine. By storing digital instructions and parameter tables directly within the machines, the probability of errors is reduced. Even if problems do crop up, TRUMPF is on hand to support customers with the services and rapid remote support they need.



Small batch sizes

Modular automation components are perfect for balancing out variations in job size. Combined with smart material flows, efficient intralogistics and a one-click production planning process, fabricators can be confident of getting their volume production, one-off orders and rush jobs on the right schedule to ensure deadlines are met. Careful planning makes it economically viable to produce small batches, including one-off items.

Lack of transparency and efficiency

One of the biggest hindrances to rapid throughput is manual labor, such as searching for materials, setting up machines by hand, sorting parts and checking paper documents. TRUMPF offers digital assistance in the form of web apps that are designed to maximize transparency and keep materials moving. This creates the ideal environment for efficient interaction between people, machines and materials.

Customer details

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Machinery

- TruLaser 3030 fiber (3 kW)
- TruLaser 3030 fiber (6 kW)
- TruLaser 3030 fiber (10 kW)
- TruPunch 5000
- TruPunch 5000 with Sheetmaster
- TruBend Center 5030
- TruBend 3100
- TruBend 7036
- TruBend 5170 (scheduled for delivery in February 2024)

Jordan Yost's resume includes race car driver, owner of a car rental company, **job shop CEO and social media influencer.** This Las Vegas businessman is a born entrepreneur – and finding the fast track to success is what he does best. His company **Precision Tube Laser** is known for fast turnaround times and affordable prices. And by sharing his knowledge on Instagram and YouTube, Yost has built up an enthusiastic following in the international sheet-metal community.

02

USA

Focus on Las Vegas

TUBE FABRICATION CONQUERS SOCIAL MEDIA

PHOTOS: Steve Adams



One big family: Jordan Yost (center) founded Precision Tube Laser in 2018 together with his father, Barry (right). On the left is Operations Manager Justin Wray.

Forty-year-old company founder Jordan Yost loves seeking out new business opportunities. "I've always been fascinated by metalworking," he says. "When I sold my car rental business, I realized the time had come to turn that passion into my career." He spent two years sounding out the industry, understanding how it worked, exploring what could be improved, and analyzing its potential. But what ultimately closed the deal was the time he spent at a job shop run by a friend in Las Vegas, who produces parts for exhibition booths. That gave Yost a glimpse behind the scenes and all the practical experience he needed to reach a final decision. In 2018, together with his father Barry, Yost founded Precision Tube Laser (PTL), a provider of metal processing solutions.

From zero to hundred

PTL embraced an innovative strategy right from the start, offering lead times of 3 to 5 days, no minimum quantities and affordable prices. Since then, Yost has done a remarkable job of positioning his company as one of the country's leading fabricators of sheet-metal parts. "SMEs in the manufacturing industry have a tough time finding job shops that really cater to their needs. Our business model is to support SMEs by providing the high-quality sheet-metal parts they need in their day-to-day work, so they can focus on their core business," says Yost. Determined to bring this vision of on-demand solutions to life, PTL realized it needed to maximize automation and seek out the most cutting-edge equipment on the market. Today, its production facilities on South Pearl Street in Las Vegas are kitted out almost exclusively with machine tools

Benchmark: PTL's lightning-fast turnaround times set it apart from many other U.S. job shops.



from TRUMPF, including a TruLaser Tube 5000 fiber, a TruLaser 1040 fiber and a TruBend 5170 with ToolMaster. These machines cut and bend metal for manufacturers of air conditioning and trade-show booths as well as for auto suppliers and many other types of business.

"I've always been fascinated by **metalworking.**"

Jordan Yost, founder and owner of Precision Tube Laser

55,000 followers on Instagram

Software from TRUMPF helps the team quickly set up machines for different parts and carefully control the production process. "We love technology and we're constantly investing in the digitalization of our business," says Yost. In March 2023, PTL added a TruLaser Center 7030 to its portfolio, which Yost describes as a game changer. "Obviously, it took time to properly integrate the

machine in our workflows," he says. Ultimately, however, the new purchase has given the job shop a major edge over its competitors. "In future, we'll be able to run automated production around the clock with a team of just 25 people." Precision Tube Laser put an emphasis on digital marketing from day one, with Yost successfully harnessing Instagram and YouTube to build a strong community and engage with potential customers. PTL's



Teamwork: PTL feels like one big family that looks out for each other.

videos and posts are packed full of expert knowledge, especially when it comes to optimizing part design. Obviously, a design has to look good, but PTL also needs to be able to transfer the exact geometry of the part to its machines. “It’s very much a dialog: we keep going over the design plans until we get to the point where we can machine the metal,” says Yost. Thanks to this close collaboration, Precision Tube Laser is a partner that customers feel they can trust.

Industry goes digital

“When we first started out, we often had our backs against the wall! There were plenty of ups and downs, but we just had to grit our teeth and get through them,” he says. “As a result, we managed to find a profitable niche that’s allowed us to grow and improve year after year.” Today, PTL receives anywhere between 200 and 300 email inquiries a day. Between 30 and 50 of these

are channeled into orders with volumes ranging from one-off pieces to batches comprising tens of thousands of parts. This has helped the company consistently post annual sales in the millions. With the Las Vegas region accounting for less than five percent of its order intake, PTL’s customer base now stretches across the entire country, with orders coming in from every U.S. state. And demand is growing particularly fast on the East Coast. “Back in early 2023, we had a customer base of around 1,200 companies,” says Yost. “Now we’ve broken the 1,500 mark – and 95 percent of them are repeat customers.” The industry as a whole is undergoing a transformation, with companies eager to embrace new technical opportunities and digital solutions. “It feels great to be helping them along that path.”

Yost is keen to maintain his entrepreneurial focus and continue to move PTL forward. With such a high order volume, some might be tempted to double the size of the team, but Yost is determined to keep the workforce lean. By increasing its level of automation, Precision Tube Laser can certainly raise its game even further, but growth for growth’s sake is not on the agenda. “This company feels like one big family where everyone looks out for each other – and that’s how I want it to stay,” says Yost with a grin



The right attitude: To work at PTL, you need commitment and the willingness to learn something new every day.

PHOTOS: Steve Adams

02

A closer look:

Training and consulting for part design

Precision Tube Laser CEO Jordan Yost inspires his online community with regular **posts and videos** on how to optimize part design. TRUMPF’s **diverse training programs** teach participants about numerous aspects of part design, including the latest technologies and design guidelines.

In brief

The smart approach to part design

“Form follows function” is a design principle many companies are familiar with. Essentially, it means that the shape of a part should relate to its intended function. Optimizing how a part is designed also offers significant potential for savings. **TRUMPF’s training and consulting services** in this field help engineers to design parts more efficiently, showing them how to use less material while simultaneously increasing rigidity through smart bending strategies.

Intelligently designed parts are essential to efficient production. By cleverly combining functionalities and minimizing process steps and rework, they pave the way for standardized, connected manufacturing. TRUMPF’s training and consulting services provide engineers with the key knowledge they need to design better parts. Courses are available in the following formats:

Seminars By redesigning their parts, design engineers and product developers can help streamline the production process. This requires extensive knowledge of manufacturing techniques such as bending, punching and welding. Knowing exactly how the machines work and what additional functions they offer is the key to achieving great results. TRUMPF seminars give participants from various companies the chance to explore these issues and identify ways to produce parts more cost-effectively. Participants can apply their new skills in practical exercises on part design and optimization. Seminars can be held in Ditzingen or online.



Workshops TRUMPF workshops cover the same content as its seminars. The difference is that all workshop participants come from the same company. This means they can also optimize their own parts as well as improving their general knowledge of production-optimized design. Workshops can be held in the company’s local language, either at its premises or at TRUMPF’s site in Ditzingen.



TRUMPF’s part-design experts have many years of experience in designing and manufacturing parts. Over the past few years, they have conducted over **1,500 training sessions and consultations**, helping some **14,000 people** to optimize the design of their sheet-metal parts, tubes, laser-welding processes and fixtures for laser and arc welding.

Part consulting TRUMPF’s part-design consulting service is a great option for companies looking to optimize a specific component or assembly. TRUMPF experts work closely with the company to analyze its fixtures and components, developing ideas and possible solutions in a collaborative process. Participants are also given the documentation they need to implement the optimized designs directly in their CAD software.

Optimate

TRUMPF training courses and consultations give designers and developers the skills they need to design parts that can be manufactured more economically. In addition, TRUMPF start-up Optimate offers a cloud-based application that simplifies the tasks sheet-metal fabricators face on a daily basis. The Optimate app checks in real time whether a part design can be optimized and provides a breakdown of costs and alternative design options. Users simply upload the CAD data for their parts to the online platform and the AI instantly calculates where they could replace welds with bends. The algorithm also detects cut-outs that are too close to a bending edge and cases where the flange length is too short. The Optimate app is a useful addition to TRUMPF’s part-design training and consulting services.



Customer details

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Machinery

- TruLaser Center 7030
- TruLaser Tube 5000 fiber
- TruLaser 1040 fiber
- TruBend 5170 with ToolMaster



03
MALTA

Focus on Birżebbuġa

MEDITERRANEAN EFFICIENCY

PHOTOS: Simon Fenech

Based on the island of Malta, family business **Seifert Systems** employs 450 people and produces a wide range of air-conditioning systems for control cabinets. Recently, CEO Michael Seifert inaugurated a **new smart factory** that he hopes will increase productivity fourfold. When it comes to **sustainability**, the company isn't afraid to experiment – and its willingness to break new ground has attracted the attention of some of Europe's top politicians.



Well placed: Seifert's headquarters on Malta's southern tip offer impressive views of the Mediterranean.

When Michael Seifert opened his new smart factory in spring 2023, Maltese Prime Minister Robert Abela stopped by to join in the celebrations. Just 18 months had passed since the CEO announced that Seifert Systems was planning to build a digitally networked, zero-emission, highly automated factory. Standing in front of a STOPA storage system, Abela praised the family business's pioneering role on the Mediterranean island, highlighting how the company's commitment to sustainability made it the perfect match for Malta's economic vision. The new smart factory produces components for cooling units – and the investment has clearly paid off. The CEO and his team hope this new approach will transform the company's future.

Focus on the future

A few months after Abela's visit, Michael is sitting next to his son Philipp in his Maltese office. Philipp Seifert is the third generation of the family to work at the company, and he recently led the project to install a STOPA storage system in the new smart factory. The STOPA system feeds raw materials into a TruMatic 7000 punch-laser machine, a TruPunch 5000, a TruBend Center 7030, a TruBend 5085, a 3100 and a 7050. TRUMPF will also be delivering an additional TruBend 7050 in September. With 16 towers and 592 storage bays, the fully automated system has enough capacity for some 1,690 metric tons of material, including both



finished products and raw materials. The switchover to the storage system and accompanying software is probably the most significant transformation of the company's production operations since it relocated to Malta. Yet however ambitious his plans for the future, Michael is still very much in touch with his roots. From behind his desk, he pulls out the hour meter from the company's first TRUMPF machine, a TruMatic 500 punch machine that he acquired in 1995. After many years running in three shifts, the TruMatic 500 is no longer in operation. But he was determined to hold on to the meter, which displays the impressive figure of 167,936 hours. "An engineer once told me that was the highest number of operating hours he had ever seen on a machine of this type," says Michael. It is equivalent to an uninterrupted 6,997 days, or 19 years.

Seifert Systems specializes in air conditioning systems for electrical enclosures and control cabinets. The company's products protect the sensitive high-tech electronics used in applications such as wind turbines and mobile-phone masts. Its solutions cool, heat and filter the air around electronics, whatever the local climate conditions. It all began in 1965 in the kitchen of Michael's grandmother in the German town of Schwelm. Michael's father Rolf was intrigued to see how much heat was emitted by the electronics he was working on. With passive cooling yet to be invented, Rolf started developing his own product. "He sat at the kitchen table sawing up pieces of aluminum and anodizing them on the stove," says Michael.

Rolf's business soon picked up steam, and he moved into his own garage situated on Weststraße in Schwelm. During those early years, his customers included the German radio and television sector as well as consumer electronics companies such as Grundig and Loewe. In 1970, five years after his first experiments on the kitchen stove, he finally moved into his own premises. As the

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“ The telecommunications boom motivated us to invest in our first sheet-metal processing machine. That was the spark that led us deeper and deeper into the value chain. ”

Michael Seifert, CEO Seifert Systems

1970s unfolded, Rolf realized that instead of just cooling the electronic components, he also needed to cool the enclosures that surrounded them. This realization laid the foundations for the range of products that Seifert Systems makes today.

A chance trip to Malta

A few hundred meters behind the new STOPA storage system, the Maltese cliffs plunge into the Mediterranean. Seifert Systems is situated at the southernmost tip of the island. This area used to be a strategic vulnerability for the local inhabitants, with the flatter stretch of land in the Wied Znumber valley offering pirates easy access between the cliffs. Today, the

Digitalization: The smart factory is guiding the company into the next generation. Michael and Philipp Seifert have managed to quadruple production in half the space.

island's historic defensive structures and ancient walls are connected by a network of stony trails. Malta's Achilles heel ended up becoming something of an economic powerhouse, at the heart of which is Seifert Systems and its 450 employees.

It was chance that led Rolf to relocate to Malta in 1990. Just two years earlier, his plans to keep growing his production in Germany had been thwarted by labor shortages. "My father was very much focused on the local region, and he didn't really want to leave," says Michael. Rolf cast his eye far and wide, from Belgium all the way to Scotland and Ireland, but he was reluctant to relocate his business abroad. Until, that is, he met Helga Ellul by

the pool on a vacation to Malta. From 1976 to 2012, Helga ran a factory on the island belonging to toy maker Playmobil. As Ellul and Rolf started chatting, she gradually opened his eyes to Malta, its production facilities, and the benefits the island offered. It was around this time that the Maltese government began offering all sorts of packages to attract foreign investment. To this day, Playmobil Malta and Seifert Systems continue to occupy neighboring premises in an industrial park within view of the Wied Znumber valley. Rolf focused his full attention on the island and continued to expand his production capacity.

New site, new challenges

Seifert was one of many companies to benefit from the boom in the telecommunications industry in the 1990s. The company soon realized that its German supplier network could no longer keep up with the Maltese business. This was one of the first challenges Michael faced when he joined the company in the early 1990s. It was around this time that the company forged a relationship with TRUMPF that continues to this day. "The telecommunications boom motivated us to invest in our first sheet-metal processing machine," says Michael. "That was the spark that led us deeper and deeper into the value chain."

To start with, Seifert focused almost entirely on the telecommunications industry, mirroring its development and growth. One year after taking up his new post, Michael purchased a TruMatic 500. Next, he set to work on the automation aspects, investing in a SheetMaster and a GripMaster. "We had the machines running 24 hours a day, seven days a week," says Michael. Fast forward to the early 2010s, and the company was beginning to reinvent itself and customize its products. "We were keen to



PHOTOS: SIMON FENECH

Efficiency: The new STOPA system optimizes the use of space and automates the production process.



Custom-made: Seifert offers standard products tailored to each customer's specific needs.

Generations: Michael Seifert and his son Philipp are enthusiastic innovators who are not afraid to experiment.

broaden our focus to include mechanical engineering, the food industry and other applications. We saw demand for cooling just about everywhere," he says. They gradually expanded their portfolio, paving the way for more and more variations in their products. Today, Seifert still offers a range of what Michael refers to as standard, catalog products, but its strengths arguably lie elsewhere. "We pride ourselves on being able to meet customer-specific requirements. I always tell my customers that we focus on making what they need, not what we already have!" The company now boasts a total of 1,300 product codes for control-cabinet cooling systems. This versatility has been good for business: over the past ten years, Seifert has tripled its sales in Malta.

Investing in sustainability

Michael Seifert is an innovator. He firmly believes in the importance of optimizing the value chain, especially when it comes to energy efficiency measures. The company's production facility has 3,000 solar panels on the roof and is certified carbon neutral. Workers are currently digging a gigantic hole for a subterranean reservoir that will collect rain from the rooftops. The goal is to store enough water to meet all the company's needs. Seifert Systems even makes its own cardboard boxes in order to avoid using plastic. "We carefully examine every value chain to see whether we can improve things," says Michael. These are the kinds of measures that keep the company in the public eye, and Maltese Prime Minister Robert Abela isn't the only VIP to have visited the site. On October 7, 2022, German President Frank-Walter Steinmeier also stopped by to see the new facility.



PHOTOS: Simon Fenel



Sustainability: Seifert harnesses the power of the sun and collects rainwater to meet its production needs.

Switching to a smart factory is a major step forward for Seifert. Previously, someone always had to keep track of which sheet-metal parts the workers should be punching and what materials the company would need in the weeks ahead. Leftovers were sometimes discarded and forgotten, especially for metals that were rarely used. But the smart factory aims to tackle these issues head on. "Oseon keeps track of every step in the smart factory's processes," says Philipp. TRUMPF's Oseon software

“ We pride ourselves on being able to meet **customer-specific requirements.** ”

Michael Seifert, CEO Seifert Systems



Investments: The company has invested a lot in the future, but it is still in touch with its roots.



Switchover: The software monitors production and maximizes utilization of the sheet metal to avoid scrap.



“ The **software** keeps track of everything in the smart factory. ”

Philipp Seifert, Production Operations Manager Seifert Systems

takes charge of the production facility, monitoring the machines and processes as well as the finished parts and warehouse stocks. It also plans production with top-notch efficiency, making optimal use of materials when nesting parts and ensuring that finished parts are stored, but not forgotten! “If we are processing similar parts in different machines over the course of several weeks, Oseon will help us continuously optimize how the parts are arranged on the sheet,” says Philipp. Once the changeover is complete and the software is fully integrated, the company estimates it will be able to produce four times the volume of parts in a quarter of its previous production space.

PHOTOS: Seifert, Simon Fenech

03

A closer look:

Solutions for the punching process chain

Punching is a key part of production at Seifert on the island of Malta. This technology can be challenging to master, especially when it comes to more **demanding manufacturing jobs**. TRUMPF offers its customers solutions for the entire punching process chain – from part design to production optimization.

In brief

Successful punching – from A to Z

Punching and punch-laser machines can be used to carry out all sorts of tasks, from punching and forming to deburring.

Punching technology is impressively versatile, accurate and eco-friendly, but it typically requires a broad array of knowledge, design skills and programming expertise. TRUMPF strives to meet these needs by launching solutions that cover the entire punching process chain.

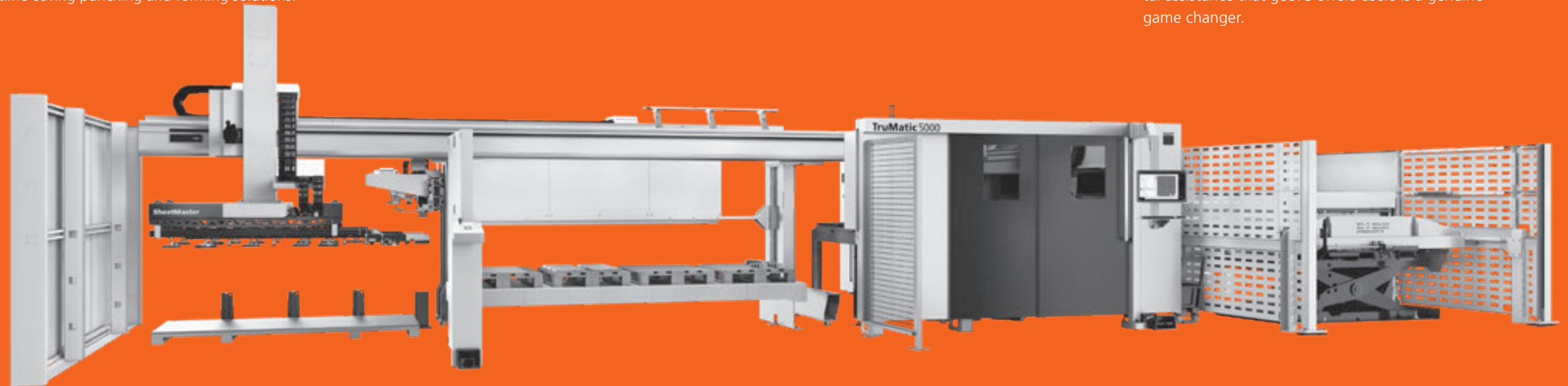
01

DESIGN The success of a punched part starts with the right design. To assist with this initial part-design process, TRUMPF offers the cloud-based app **Optimate** to complement its wide range of training courses. In addition, the company's **PunchGuide** app gives users access to comprehensive knowledge gained from decades of experience in punching technology. PunchGuide also includes ideas and advice on the best sheet-metal part designs for punching, as well as a selection of sample parts from everyday design contexts. The app works as both a reference tool and a useful source of know-how. It offers valuable insights into time-saving punching and forming solutions.



02

PRODUCTION SET-UP The next step is to prepare for production by programming the machines for the job and equipping them with the right tools. **TruTops Boost** is a software package for 2D/3D design and programming that makes it easy to transfer part geometries into an NC program – almost at the touch of a button. **ScaleNC** is the perfect solution for companies that have to rely on external CAD experts because of in-house bottlenecks or limited capacity, as well as for businesses that want to determine their own growth trajectory. As well as preparing technical drawings, CAD data and assemblies, the cloud platform can also generate manufacturing models tailored to the user's machines. ScaleNC can also handle the entire NC programming task, carefully tailoring the NC programs to achieve optimal part quality, process reliability and cost efficiency. It also support users in optimizing the design of the programming process.



03

PRODUCTION The next step is to manufacture the part. TRUMPF offers a diverse range of punching and punch-laser machines to meet users' needs. Its latest addition is the TruMatic 5000 punch-laser machine. Combined with the new SheetMaster and other automation components, the **TruMatic 5000** laser-cuts, punches and forms parts in a highly productive and fully automated punch-laser manufacturing cell. Its six-kilo-watt TruFiber laser helps users cut complex contours, while the patented DeltaDrive delivers energy efficiency gains of up to 30 percent. It also includes a descending die that ensures high part quality during processing. Combining the machine with the automated tool and nozzle changer allows it to operate independently for several hours without manual intervention. The new TruMatic 5000 is a particularly good choice for companies that want to take their productivity to the next level with the aid of automation. It is suitable both for companies that have already connected up their factory, as well as those that are planning to do so. Typical applications include industrial kitchens, control-cabinet manufacturing and the furniture industry.



04



OPTIMIZATION When football players finish a game, they're already thinking about the next one. The same applies to day-to-day work on the shop floor. Once a part has been produced, stored and shipped, the next job is often waiting in the wings, and there's generally little time left to optimise the production process, and limited knowledge of how it could even be done. The application and machine experts from **goBIC** can reveal untapped potential for improvement in areas such as machine runtime, batch sizes, quality, and the availability of punching and punch-laser machines. Their digital platform interprets machine data and unearths ways to optimize the production process. The personalized digital assistance that goBIC offers users is a genuine game changer.

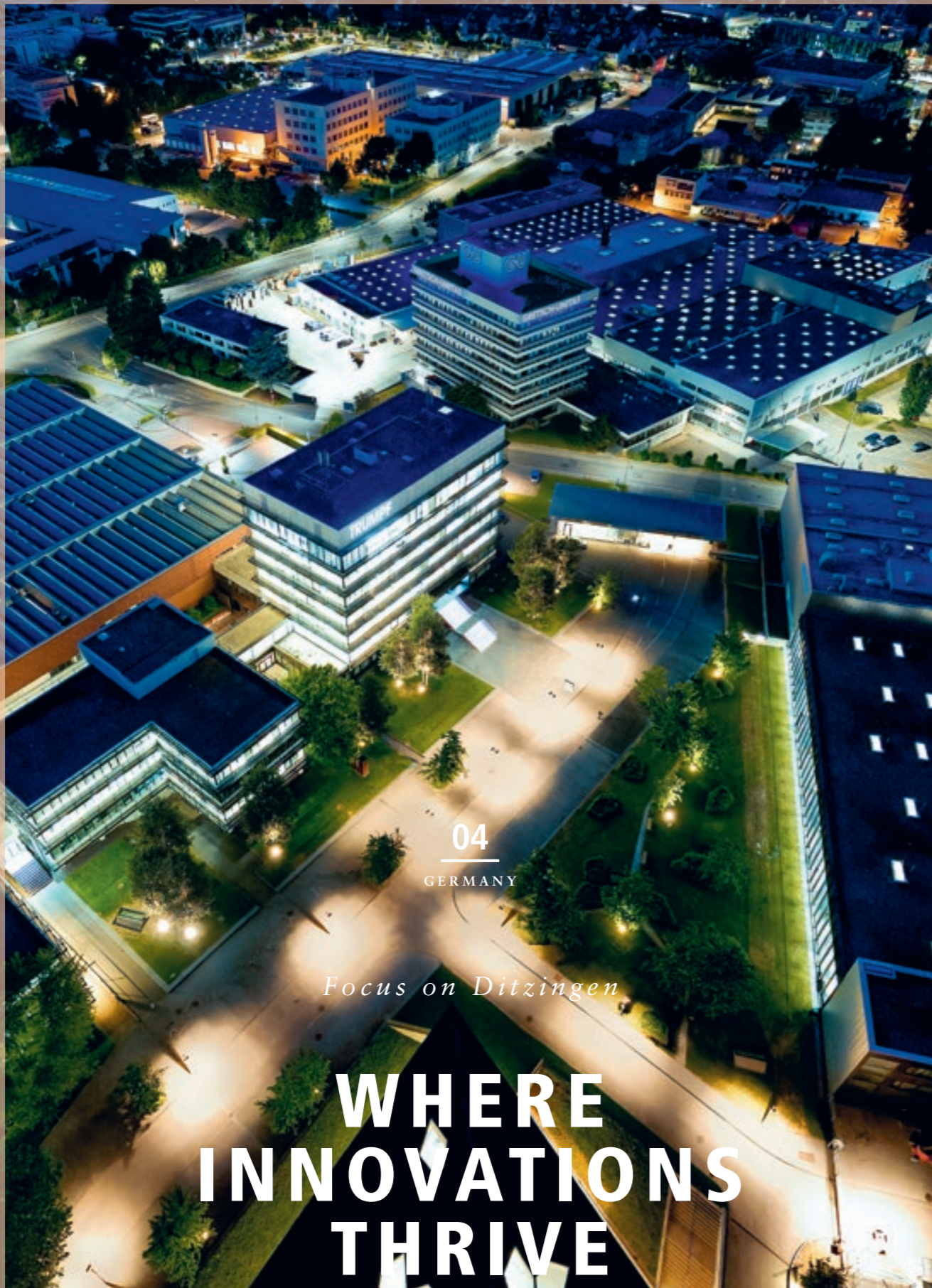


Customer details

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Email: info@seifertsystems.com

Machinery

- TruMatic 7000
- TruPunch 5000
- TruBend Center 7030
- TruBend 3100
- 2x TruBend 7050
- TruBend 7085
- STOPA Compact storage system



04

GERMANY

Focus on Ditzingen

WHERE INNOVATIONS THRIVE

PHOTOS: TRUMPF

Bird's eye view: The TRUMPF campus in Ditzingen showcases industrial architecture at its best.

The TRUMPF campus in Ditzingen offers a perfect **combination of design and functionality** that constantly pushes people's creativity to new heights. Well-planned, sustainable buildings with a clear focus do not necessarily need to be expensive – not even those that win awards.



Regine Leibinger and Oliver Maassen – Industrial architecture is fascinating, says Regine Leibinger, Managing Partner at Barkow Leibinger, who has won several awards for her buildings. Oliver Maassen, Chief Human Resources Officer at TRUMPF, values the ties between architecture and culture.

TRUMPF's company fitness center in Ditzingen enjoys a prominent position on top of the logistics center. From

here, 30 meters up, you can see the A81 highway stretching in both directions. As always during rush hour, it is packed with immobile vehicles as far as the eye can see, so the employees have plenty of time for another round of exercises before heading home. The architecture firm responsible for planning this sports center and almost all the rest of TRUMPF's Ditzingen campus is Barkow Leibinger. Over the years, and under the guidance of its two founding partners Regine Leibinger and Frank Barkow, the firm has designed buildings for administration, manufacturing, customers and training, as well as a daycare center. And everywhere visitors look – from the facades and roofs to the interiors – they immediately spot the recurring sheet-metal elements that symbolize what TRUMPF stands for.

Many of these buildings have won awards. One example is the "Blautopf", the staff restaurant and social hub of the Ditzingen campus, which has won some of the most prestigious

architectural awards on both a national and international level. Chief Human Resources Officer Oliver Maassen

describes it enthusiastically as Ditzingen's version of the Elbphilharmonie, Hamburg's famous concert hall. The staff canteen does indeed host the occasional musical performance, most recently to celebrate TRUMPF's 100th anniversary.

"It's impossible to plan TRUMPF buildings without making the effort to understand how everything works: from laser technology and digital connectivity to machine tools, AI and EUV."

Regine Leibinger, Managing Partner of Barkow Leibinger



Customer center: TRUMPF impresses customers with its combination of outstanding industrial architecture and superb product quality.

Trademark break rooms and common areas

Long-time TRUMPF CEO Berthold Leibinger always understood the importance of outstanding architecture, says his daughter Regine. He once said that “good work can only take place in good spaces”, and Maassen takes a similar view: “The best foundations for a successful business are an appealing work environment for employees and a good management culture.” Break rooms and common areas are a hallmark of this internationally renowned architecture firm, and their projects also favor broad staircases that encourage people to sit down. “These are places where people can spend time together,” says Maassen. Employees from production, development and administration



gather in these spaces to chat about their work or about personal matters such as family and football. Maassen argues these kinds of conversations are “extremely valuable and inspiring”. Arnim Brüche, who heads up production at TRUMPF, agrees, insisting they are essential to a successful business. “We can’t have innovation without social contact,” he says.

Flooded with light: To encourage listeners to engage with each other, the auditorium in the new training center features long rows of seating instead of chairs.



Little ones welcome

Ditzingen is a particularly popular destination during TRUMPF’s INTECH in-house trade show. This event often welcomes school classes, and TRUMPF endeavors to get even its youngest visitors interested in technology with age-appropriate games and demonstrations.

“A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption of our work. He is the purpose of it.”

The words of Indian visionary Mahatma Gandhi hang in the corridor leading to the canteen, next to photos of laughing Indian women. Good architecture and diverse artworks both have a place at TRUMPF. Regine Leibinger’s fascination with industrial architecture makes her something of an anomaly in her trade. Industrial construction “always smells of lubricating oil”, she says with a mischievous grin. Her architect colleagues tend to view museum and library buildings as far more prestigious undertakings. But perhaps their reluctance also stems from the in-depth knowledge on technologies and workflows that any good industrial architect needs. “It’s impossible to plan TRUMPF buildings without making the effort to understand how everything works: from laser technology and digital connectivity to machine tools, AI and EUV,” says Leibinger.

Good industrial architecture needn’t be expensive

Construction costs and project budgets are a key focus of any job, and they set the parameters of Regine Leibinger’s work. However keen a company is to move forward, that’s no guarantee that the project will get off the ground. “Many companies simply don’t want to spend the money,” she says, with the same directness she applies to all her work: “But good industrial architecture needn’t be expensive.” She notes that today’s technologies move fast, which is why industrial buildings that allow for flexible use will always pay off.



Fitness center: How’s the rush hour looking on the highway? The fitness center in Ditzingen is the perfect place to check for traffic jams.

It can sometimes take time for ideas to come to fruition, and this slow maturing of a concept is something Leibinger has also experienced at TRUMPF. She cites the example of the new customer center, which entered the design and development stage several years ago and is now set to become reality as a “vertical factory”. The concept in this case is based on an unusual approach: vacant lots are in short supply at the Ditzingen location, so TRUMPF and Barkow Leibinger decided to stack the work processes and required applications one on top of the other.

Growth in every dimension

Planning of the company’s own apartments is also still at a preliminary stage. These would be a major plus in the battle for the brightest minds, especially since the Stuttgart region is facing such an acute housing shortage. But other construction projects have already been given the green light: Over the next four years, the family-owned company will invest 380 million euros in laser technology, the new training and excellence center and the customer center at its main site. Sustainability will obviously be a key factor in all these projects. Leibinger prefers to build durable structures that will last between 50 and 100 years, and she

PHOTOS: TRUMPF, Max Leirner



Meeting place: The Blautopf is more than just a staff restaurant.

“The **best foundations** for a successful business are an appealing work environment for employees and a good management culture.”

Oliver Maassen, Chief Human Resources Officer and member of the Managing Board of TRUMPF SE + Co. KG

prefers to make use of materials from the local region. She founded the Experimental Foundation, which explores the use of alternative building materials, for example those derived from paludiculture, a process for cultivating biomass on wet peatlands. As TRUMPF’s Ditzingen headquarters continue to evolve and the company’s premises move to the next level, there are sure to be many more architectural surprises in store.

Main entrance and reception: A glance at the ceiling is all it takes for visitors to see that TRUMPF machines are the perfect choice for laser-cutting sheet metal.





Fascinating facts and exciting innovations



Tasteful gift fabricated on TRUMPF machines

TRUMPF received a very special 100th-anniversary gift from Polish company TREKO Laser at its INTECH in-house trade show. Marek Wodnicki, CEO of TREKO, presented TRUMPF CEO Nicola Leibinger-Kammüller with a **one-of-a-kind wine rack** that his company had designed and produced using TRUMPF machines. "We've been a TRUMPF customer for 31 years. Both companies have grown tremendously over that period, and TRUMPF machines have helped us make our mark on the international stage. This gift is our way of acknowledging just how successfully TRUMPF has managed its business over the past 100 years," says Wodnicki. The wine rack was filled with bottles from the Lesser Poland region where the company is based.



TRUMPF sales revenues up 27 percent in anniversary year

At the close of the fiscal year 2022/23 on June 30, 2023, the TRUMPF Group recorded a significant 27 percent increase in sales to **5.4 billion euros** (fiscal year 2021/22: 4.2 billion euros), the highest sales revenues in the company's 100-year history to date. The order intake again exceeded the 5 billion mark, but at 5.1 billion euros fell noticeably short of the previous record level (fiscal 2021/22: 5.6 billion euros). It therefore decreased by 8.8 percent. At 615.4 million euros, the Group's operating earnings before interest and taxes (EBIT) grew positively by 31.4 percent compared to the previous year (468.4 million euros). As a result, TRUMPF achieved an EBIT margin of 11.5 percent (previous year: 11.1 percent) despite increased raw material, logistics and personnel costs.



Trade Finance – TRUMPF Bank advances funds for material costs

The uncertain economic situation, rising energy costs, shifts in material availability, high interest rates and high purchasing costs have made life increasingly difficult for businesses. Recently, TRUMPF Bank introduced **Trade Finance**, a new financing model catering specifically for material purchases that aims to help companies overcome these challenges. "Our customers have no way of knowing how long the materials they need might be available, so they often have to buy them in advance," says Joachim Dörr, CEO of Financial Services GmbH at TRUMPF. "This makes it hard to calculate costs and draw up quotations for their own customers." Trade Finance from TRUMPF Bank gives companies more flexibility in purchasing mate-

rials while simultaneously providing guarantees to suppliers. The process is simple: a company orders materials from its supplier, which bills TRUMPF Bank directly. TRUMPF Bank pays the supplier immediately and sends the company an invoice with payment terms equivalent to those offered to the end customer.

Benefits: Thanks to these extended payment terms, the company only pays for the materials once the time comes for their end customer to settle its own invoice. When material prices currently running so high, this reduces the risk of the company being caught in a financial squeeze.

PHOTOS: TRUMPF



TRUMPF fires mega-laser to mark 100th anniversary

Toward the end of summer, TRUMPF lit the **world's longest birthday candle** to mark the company's 100th anniversary. The green laser, which illuminated the night sky above Ditzingen from sunset to midnight, could be seen by some 5,800 employees and their families in the local area, as well as by partners, customers, and the general public. Visible **up to 80 kilometers** from the plant in the Stuttgart region, the laser drew numerous visitors to the Ditzingen site. Traffic on the road in front of the plant gate slowed to a crawl, and many people left the A81 highway specifically to get a closer look at the laser show. This was an impressive yet **energy-saving** spectacle: the green mega-laser consumed only as much electricity as 6 to 8 people blow-drying their hair at the same time!



New intake of apprentices at TRUMPF Education Center

The start of September saw 100 young people embark on their **apprenticeship or dual study program** at TRUMPF in Ditzingen. What's particularly special about this year's intake is that they will be studying in the recently opened TRUMPF Education Center, a 4,000-square-meter facility that offers plenty of space to get students learning as efficiently as possible. TRUMPF is increasingly focusing on training and apprenticeships in the digital and IT arena, such as cyber security. Subjects with a digital focus benefit from a very special learning environment at the Education Center. Based on the TRUMPF Smart

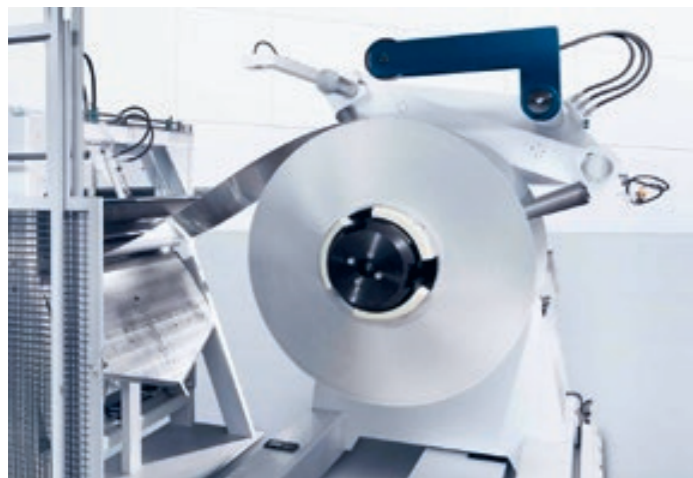
Factory in Chicago, students and apprentices get the chance to experience key TRUMPF technologies and connectivity options up close to gain detailed insights into how they work. "Digitalization and connectivity play a major role in our products. TRUMPF is cementing its position as a fully fledged solution provider," says Marco Klein, who is responsible for training at the Ditzingen location. "That's why it's so critical for apprentices to understand the complete process chain right from the start of their training."



TRUMPF invests 380 million euros in Ditzingen site

TRUMPF will be investing some 380 million euros in its Ditzingen headquarters between now and 2027. This marks a major commitment to the plant and the greater Stuttgart area, says CEO Nicola Leibinger-Kammüller. Most of the money will be spent on constructing new buildings or expanding existing ones. By fall 2023, the high-tech company will have invested almost 200 million euros in its new **production facility and offices for laser technology** and in its new **TRUMPF Education Center (TEC)**. Starting with this year's intake, the TEC will offer the perfect learning environment for talented young TRUMPF apprentices and trainees. By 2027, the company will invest a further 180 million euros, most of which will be spent on a new customer center with a smart factory and in-house sheet-metal fabrication.

Laser-cutting from coil stock: ten key benefits of the TruLaser 8000 Coil Edition



With coils weighing 25 metric tons, up to two robots, and nonproductive times pared down to less than ten seconds, the TruLaser 8000 Coil Edition from TRUMPF is a flexible, automated productivity powerhouse. The laser cuts parts straight from the coil, which are then removed from the machine by robots. But what are the key benefits of laser-blanking technology?



01 Cost-effective production whatever the batch size

The ever-increasing number of variants in series production brings new challenges: Some quantities are too large for 2D laser cutting machines, while press lines are not flexible enough and a too large investment. In these cases, laser blanking enables simple and fast production with the best part costs - both for sheet metal working contract manufacturers with extensive batch sizes and for series manufacturers.



02 Flexible production without tool changes

Press lines used to be the go-to tool for volume production. The problem is that each new part variant requires a new press tool, or die. Users have to fabricate the tools, swap between them, and maintain and store them, all of which costs time and money. In contrast, a laser can handle the most diverse variations in geometry with no trouble at all. TRUMPF programming software makes it quick and easy to adapt the machine to different parts.



03 Less material costs and more sustainability

Coiled sheet-metal is up to 15 percent cheaper to buy than individual sheets. Users also benefit from up to 15 percent higher material utilization. Nesting parts on a coil line is far more efficient than using individual sheets, because the layout is only restricted on two sides rather than four. More efficient material utilization means greater sustainability, with companies that employ coil technology potentially saving up to 1,700 metric tons of steel a year, equivalent to some 4,000 metric tons of CO₂.



04 Processes a wide range of materials

From high-strength steel and aluminum to material combinations such as hot-forming steels, the machine can cut a wide range of materials on the same production line. This gives production planners more flexibility.



05 Fully automated manufacturing process

From unwinding and aligning the coiled metal to cutting the parts and removing and sorting them using a robot, the system performs all the functions of a fully automated cutting center. This makes life easier for operators and reduces the hassle of searching for hard-to-find skilled workers.



06 Minimizes non-productive time

Continuous cutting of coil stock minimizes non-productive tasks such as loading and unloading. It takes less than ten seconds for a conveyor belt to move new material into the machine and transport the cut parts to the unloading station, while the machine simultaneously disposes of scrap.



07 Smart Optimization

TRUMPF's TruTops Boost software suggests optimal nesting and cutting strategies to make the most of the material and streamline scrap management. The software increases process reliability and prevents parts from getting caught in the scrap skeleton.



08 Simple to control

The entire line – from the coil stock to the pallets of finished parts – can be monitored and controlled from a single operator module. Users can also use the portable operator module for set-up and servicing tasks at any of the key points in the system.



09 Quick, reliable sorting

Depending on the configuration, either one or two robots are used to remove parts from the machine. One of the biggest benefits is that users require no specialist knowledge or training to teach the robot. All they have to do is define where parts should be deposited, and the software takes care of the rest.



10 Automated unloading

The laser-blanking system can be flexibly connected to automated storage systems and can even be unloaded using automated guided vehicles. This facilitates the transport of cut parts to downstream process steps such as automated bending.

Check it out!

THE WORLD'S FASTEST MOBILE BENDING CELL

The new **Flex Cell** is TRUMPF's automation solution for the highly efficient TruBend 7050 bending machine. The **mobile robot cell** can be connected to the machine in a matter of minutes. Once the simple docking steps are complete, the Flex Cell and TruBend 7050 form a production unit that is **fully automated, highly productive**, and capable of working through an entire night shift. This helps companies handle surges in orders without having to hire more workers. TRUMPF will be unveiling its mobile robot cell in fall 2023 at the Blechexpo trade fair in Stuttgart.



Combined with the TruBend 7050, the Flex Cell is the world's fastest mobile bending cell.

2X

The Flex Cell has a **double-sized material buffer** that allows it to supply the TruBend 7050 with enough material for multiple shifts. In total, this is equivalent to the loading area of a Euro pallet. The material buffer can accommodate 3,400 A4* or 5,100 A5* blanks.

*Based on the assumption of 0.7 millimeter-thick structural steel, 30-second production time, loading on both sides and ejection of finished parts through the chute.

24/7

The **Flex Cell** enables users to exploit the bending machine's full capacity around the clock, choosing either manual production of complex parts or automated, high-volume production of simple parts.

Mobile robot cell

With a footprint of **less than 10 square meters**, the mobile bending cell is compact enough to fit almost any production line.

The TruBend 7050's electro-mechanical direct drive helps **reduce energy consumption by 40 percent** and increases average performance in the bending process by 42 percent.

The **combination gripper** on the robot arm consists of a mechanical gripper and a vacuum unit. As well as facilitating fast and reliable bending, it can also be used to load and unload a range of parts.

TruBend 7050 bending machine

Combined with the Flex Cell, the TruBend 7050 bending machine can perform automated bending of A5-format blanks for **42 hours***.

Part formats:

Minimum 70 × 50 mm
Maximum 600 × 400 mm

Sheet thickness:

0.7 mm–6 mm

Thanks to its **automatic double-sheet detection** system, the Flex Cell can detect whether raw material has stuck together during loading and eject it where necessary. This ensures a stable process while reducing scrap and saving resources.

What companies can benefit from the Flex Cell?

Combined with the TruBend 7050, this mobile bending cell is suitable for companies that are seeking an automation solution to boost productivity for small and simple parts.

05

FUTURE

Tomorrow's problem solvers

KEVIN: ALONE IN THE LAB

PHOTOS: Fraunhofer IPA

At Fraunhofer IPA in Stuttgart, **high-tech robots** weld metal, sort screws, and move parts from one box to another, while researchers ensure they complete each task correctly. Eventually, the IPA team hope the **robots will teach themselves** to do the jobs even better.



High-tech helpers: There are more opportunities than ever to use cobots in welding jobs.

Kevin spends a lot of time on his own in the lab – and he's constantly on the move. One minute he's retrieving a batch of sample tubes from the cupboard and taking them over to the lab bench, the next he's taking another batch back and doing some general tidying. Every now and then, he takes a quick break to top up his energy levels at the charging station. Few robots at the Fraunhofer Institute for Manufacturing Engineering and Automation IPA in Stuttgart have their own name – but Kevin is one of them. His robot colleagues are typically referred to by cryptic abbreviations or descriptive monikers such as "cable robot simulator". What they all have in common, however, is that they are shaping the future of robotics.

Focus on production

Fraunhofer IPA is one of the largest institutes in the Fraunhofer-Gesellschaft, employing some 1,200 people. Its researchers

seek solutions to complex challenges faced by industrial enterprises. According to the IPA's website, they "develop methods, components and devices, right up to entire machines and production lines". Werner Kraus heads up the Robot and Assistive Systems department at Fraunhofer IPA. He spends his days coming up with new solutions for industrial robots in areas such as welding, gripping and sorting.

But even a renowned expert like Kraus is hesitant to say where robotics might be ten years from now. Predicting how this field will develop is difficult, because the components, parameters and areas of work are all so complex. IPA's teams are made up of software programmers, mechatronics engineers, mathematicians, industrial designers and even metalworkers and welders, all of whom work together to find robust solutions that will produce a reliable process.

"In ten years' time, robots will be able to perform complex tasks that are currently performed by humans. They will have the ability to learn, to adapt and to communicate with people in natural ways. This will lead to profound changes in many areas of our lives."

Google's Bard AI

"That's how we came up with a welding robot in record time," says Kraus. The metalworker and the welding expert in the team ruled out an academic and excessively complicated approach and replaced it with a much simpler and more cost-effective solution. TRUMPF also collaborated in this project. In ten years, Kraus predicts that most welding shops will have at least one and possibly several robots to apply precise weld seams. These high-tech helpers could ease the shortage of skilled labor, at least in this field of work. And human welding experts would be freed up to focus on trickier welding jobs.

" In future, I'll simply tell the robot what needs doing, and it will take care of **programming and **configuring itself**. "**

Werner Kraus, Head of Department Robot and Assistive Systems at Fraunhofer IPA



The path toward automated assembly: Thanks to their precision and endurance, robots offer huge opportunities to boost efficiency on the production line.

Programming on command

Ten years from now, interdisciplinary teams comprising a mix of experts from companies and institutions such as Fraunhofer will be as commonplace as self-programming robots. Many companies have machines that have spent decades doing the same job they were originally programmed to do. Modifying the program in order to optimize their long-outdated processes is virtually impossible, or at least prohibitively complex and expensive. "In a few years from now, I'll simply tell the robot what needs doing, and it will take care of programming and configuring itself," says Kraus. AIs such as ChatGPT, Bing and Bard will give this self-programming revolution even more of a boost, ultimately helping to alleviate the severe shortages of skilled human programmers.

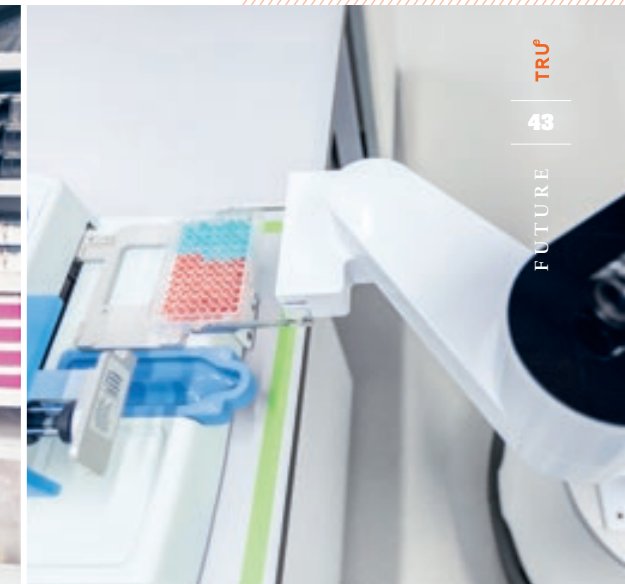
In future, the machines' algorithms will be capable of handling situations that are totally new to them and dealing with things they have never seen through their cameras. The pace of development will continue to increase, especially in AI-based image processing. This will benefit robots, for example by allowing them to grip previously unseen sheet-metal parts of all shapes and sizes and, ideally, to assign them to the right categories. This is one of the key aspects that TRUMPF and Fraunhofer IPA are working on now.

Getting a grip: Artificial intelligence and machine learning can help robots take charge of sorting bulk material at the start of an interlinked production line

PHOTOS: Fraunhofer IPA



Always on the go: Mobile robots help with lab work, for example by transporting consumables from one workstation to the next.



Autonomous worker: Kevin helps out with various tasks in the lab, such as inserting sample tubes in measuring devices.

Limiting factor

Kraus points to another issue that he says is even more important to the future development of robotics: "We need to completely rethink our concept of robot safety." To illustrate his point, he describes how high-speed trains rush past station platforms without any particular safety precautions – exactly the kind of situation that would be inconceivable in a factory. He argues that the safety provisions we currently enforce on the shop floor fail to take into account people's sense of personal responsibility. Safety coordinators assume that workers will act clumsily, if not downright negligently, and end up simply running headlong into a robot. "In every other area of life, such as driving a car, we assume that people will take personal responsibility for their actions." This explains why Kraus is hoping for a complete rethink of robot safety: "For many years, this has been the limiting factor."

Kraus's favorite robot is the cable robot at Fraunhofer IPA. He actually wrote his doctoral thesis on cable-driven robots, which soccer fans will have seen controlling the cameras that hover above the pitch during live broadcasts. Fans of Helene Fischer or

"In ten years, robots might well be capable of using advanced artificial intelligence to perform complex tasks in various environments including households, healthcare and logistics. We are also likely to see improvements in how they interact with humans using speech, gestures and facial expressions, and how they navigate safely through unfamiliar surroundings. More robots could also be used in industry to make production processes more efficient."

ChatGPT, OpenAI's chatbot



Pink will also be familiar with these robots, which the singers use to make them fly or slide through halls or stadiums while safely strapped in place. With its eight perfectly combined and coordinated cable winches, researchers can even use the IPA cable robot to simulate a Mars landing. A mission to Mars may seem like a pipe dream, but one thing is certain: Most things on the red planet will require the assistance of robots.

Gaining ground: Robots have long been a common sight in volume production. But now assistance systems are increasingly being used for short production runs.





Innovations, technologies and future trends



Smart teaching with self-programming robot from TRUMPF

This fall, TRUMPF launched a robot that programs its own weld path. The robot relies on new **Smart Seam Tracking** technology developed by TRUMPF in collaboration with the Fraunhofer Institute for Manufacturing Engineering and Automation IPA. "This solution basically allows the welding robot to program itself. That makes it much easier for users to transition into automated arc welding, which gives them a clear competitive edge," says TRUMPF R&D manager Sven Klingschat. Housed in the welding torch head, the sensor automatically calculates the weld path for each individual part. Conventional welding robots require workers to program a new weld spot into the soft-

ware each time they want the robot to change direction. This is a time-consuming process, especially when it comes to complex parts with many curves or corners. Smart seam tracking makes the whole process a lot simpler. All the user has to do is to place the welding robot in the start position, and the technology takes care of the rest. Using the sensor, the robot determines the weld path automatically. The system software quickly calculates the weld spots and creates the welding program for the part. In a matter of seconds, the robot is good to go!



New bending cell for mid-price segment

TRUMPF will be presenting a new, fully automated bending cell for the mid-price segment at Blechexpo in Stuttgart. The **TruBend Cell 5000 Lean Edition** includes tried-and-tested TRUMPF hardware and software, including the **BendMaster bending robot** and the **TruTops Boost software** for offline programming. The machine comes in two variants, either with or without the small-parts package. Easy to program and operate, it is suitable for companies looking for an affordable, high-quality way to get started with automated bending. The automated system makes light work of small to medium-sized components such as electric charge points, control cabinets and PC housings. Depending on the size of the part, the machine can work continuously for around eight hours without human intervention.



New Coriva positioning software keeps track of things

This summer, **TRUMPF Tracking Technologies** – a subsidiary of TRUMPF – launched a new software package for location tracking in digitally connected manufacturing. Coriva is a one-of-a-kind software solution that can track the position of any object whose markers are compatible with the open localization standard omlox. "Coriva lets users track all their production operations in real time without having to invest in new IT infrastructure. This increases efficiency throughout the process chain," says Daniel Bossert, Chief Customer Officer at TRUMPF Tracking Technologies. Based on the experiences of multiple customers that are already using the solution, TRUMPF Tracking Technologies has shown that an investment in Coriva can pay for itself within as little as 12 months.

PHOTOS: TRUMPF



New entry-level bending machine launched

This fall, TRUMPF launched a new, affordable machine to help companies get started with bending technology. The **TruBend 1000** features the new Right Angle (RA) control system, which makes it extremely easy to program. It is also equipped with TRUMPF's proven tech data for metal bending. "The machines are every bit as robust and reliable as our high-end models but come with a much lower price tag," says Stephan Mayer, CEO Machine Tools at TRUMPF. A variety of machine types are on offer, with **press forces** ranging from 60 to 320 metric tons and bending edges from 2 to 4 meters. This makes the machine suitable for a broad range of bending parts.



New punch-laser machine for connected manufacturing

The new **TruMatic 5000** manufacturing cell with optimized SheetMaster offers companies a fully automated system for **laser-cutting, punching and forming** parts. The cell comes with a six-kilowatt TruFiber laser, which makes it highly productive and energy-efficient. It also includes a descending die that ensures high part quality during processing. TRUMPF has made further improvements to the SheetMaster that make loading and unloading the machine even faster and more flexible. Combining the machine with the automated tool and nozzle changer allows it to operate independently for several hours without manual intervention. The patented DeltaDrive boosts energy efficiency by up to 30 percent.



de:karb research project seeks to reduce carbon emissions in sheet-metal processing

A project consortium headed by TRUMPF and including thyssenkrupp Materials Services and the Fraunhofer Institute for Manufacturing Engineering and Automation is investigating ways to accurately determine the **carbon footprint of any component**. The goal is to create a freely accessible online platform that will show which measures, implemented at which stage of production, will result in the greatest reduction of CO₂ emissions. "Digitalization is the key to mitigating the climate impact of industry," says Tobias Oppold, TRUMPF project lead. "As a leading supplier and user of digitally connected production systems, we have everything it takes, together

with our project partners, to make the world of sheet-metal processing more sustainable." The de:karb project was launched in June and will run for three years. TRUMPF and thyssenkrupp Materials Services will connect their own IT systems to the **de:karb platform**. Using machine and production data, the project partners will be able to determine the impact of measures intended to increase sustainability. This includes the concrete reduction in carbon emissions that companies can achieve when they produce a greater number of parts from a specific amount of metal or avoid unnecessary shipments of materials.

The company that gets it done

Customers rely on Hoedtke to tackle jobs other companies can't handle. Headquartered in the German town of Pinneberg, this family business counts physicists, chemists, mechanics and innovators among its 300 employees. Together, they take on some of the trickiest jobs in the world of sheet-metal fabrication – and come up with innovations that help shape our future.



In the thick of it: CEO Joachim Hoedtke has known the company since he was a child and can still be found on the shop floor every day.

Hoedtke's factory in Pinneberg near Hamburg is home to 25 TRUMPF machines, each of which has its own name. Hoss and Little Joe are busy bending, while Luke Skywalker gets on with a welding job and Liverpool cuts sheet metal with a laser. It's immediately apparent that Hoedtke has its sights fixed firmly on the future. Since its founding 90 years ago, the company has evolved into a specialist service provider for metal and laser technology. With one site in Kiel and another in Pinneberg, it strives to make whatever its customers need.

Hoedtke started out working with furnaces and soon expanded into machine cladding and electric heaters. In 1979, the long-established company morphed into a pioneering provider of laser-cutting services. Today, Hoedtke designs and develops production-ready parts, components and entire systems for a range of industries. Its customers include household names in the medical, aviation and automotive sectors.

“Machinery is one part of the equation, but our success ultimately depends on our **employees.**”

Joachim Hoedtke, CEO Hoedtke Metall- und Lasertechnik

A fascination that began in childhood

The company has formed part of CEO Joachim Hoedtke's life since he was a child. As a boy, he rode a pedal tractor around the grounds of his grandfather's business. In the late 1970s, when Americans in suits and white sneakers visited the factory and brought modern laser technology to Pinneberg, a fascinated nine-year-old Joachim watched events unfold through a crack in the door. After finishing high school, he had to choose between machinery and medicine. A good friend pointed out that his eyes sparkled every time he mentioned his family's business. “That was when I realized that the only thing I wanted was to continue the work of my father and grandfather.”

Today, the 53-year-old is one of the most successful figures in his field, though he regards himself first and foremost as a family man – and someone who upholds the values he believes in. Joachim is engaged and inquisitive, with the dry sense of humor typical to northern Germany. Human relationships are far more important to him than even the most cutting-edge machine. “Machinery is one part of the equation, but our success ultimately depends on our employees,” is his motto.

Count on Hoedtke to get the job done

Success also requires us to admit mistakes. “I consciously embrace a culture of failure and renewal.



That's why I encourage our employees to try things out, learn new things and accept change.” He cites the laser technology that his father – a physicist – incorporated into the company as a good example. “Obviously, there were things that didn't work properly at first. But we never gave up, and we eventually reached our goal.” Even today, Hoedtke has a reputation for taking on complex jobs that nobody else can handle. “Customers and even competitors will often say that if they can't do something themselves, it's always worth asking Hoedtke, because somehow we'll manage it!” says the CEO.

Passion for providing a service

Hoedtke employs innovators, scientists, highly skilled sheet-metal workers and the kind of people who know how to get jobs done. It is also an inclusive employer that offers dedicated opportunities to

Sharing knowledge: Hoedtke believes training and development is critical to long-term success. His shop floor includes than 20 experts who are highly skilled in specific trades.



PHOTOS: Julia Knop



Machine power: Both Pinneberg and Kiel are home to cutting-edge TRUMPF machinery. Hoedtke and TRUMPF have worked closely together for many years.

people with disabilities, all of whom offer various useful skills to add to the mix. The company has always maintained a clear focus: “However broad our manufacturing capabilities, our primary focus has always been on sheet-metal fabrication. That's our core skill.” Whether dealing with simple assemblies or complex systems, Hoedtke always gets to the heart of the matter and delivers the best possible product. First and foremost, the company regards itself as a service provider. “We always ask what the customer needs, because we're here to help,” says Joachim.

Pioneer in digitalization

Digitalization is an inevitable part of the industry's future. “We were one of the first sheet-metal fabricators to use computers, and that was over 40 years ago!” says Joachim. This North German company is a pioneer in digital connectivity, and it involves its employees every step of the way. Nonetheless, Joachim is careful not to put all his eggs in one basket. He deliberately chooses machines that can be set up quickly and made available for jobs at short notice, an impressive level of flexibility that has led to Hoedtke being described as the ‘emergency services’ of the manufacturing world. So what's next on the agenda? “We'll see – but we certainly still have a few more names up our sleeve for new TRUMPF machines,” says Joachim with a smile.





SMART SAVINGS: TRUMPF PART DESIGN

Better quality at a lower cost: TRUMPF part-design workshops teach users how to get the best out of their parts and machines in order to make production more cost-effective and efficient. Each issue, TRUe takes a look at a different part to illustrate how this process works.

This issue: Form follows function

The axiom “form follows function” is credited to American architect Louis Sullivan. Regarded by many as a timeless principle of design, it emphasizes the need for objects to be designed according to their functional requirements and intended use. This can also be applied to a sheet-metal context. In fact, efficiency and practical utility lie at the heart of the learning process in TRUMPF part-design training courses. In many cases, however, there are several valid candidates rather than just a single best design, so the plural “forms follow function” is more apt!

“Many of our customers are already hard at work optimizing the design of their parts. But we always encourage them to think beyond their initial idea to see what other possibilities might be out there,” says Thomas Bronnhuber from TRUMPF Part Design. “Every option has its ups and downs. If I replace a weld with a bent part, will it be close enough to the original? Can I replace the tube in this application with laser-cut sheet metal? These are the kinds of issues you need to weigh up as a designer.”

The example below shows an original coil-holder design alongside three modified variants. The original design consists of a rectangular tube that has simply been sawed, drilled and then

welded to a metal plate. The part cost can be reduced by 33 percent just by cutting the tube and the plate with a laser and incorporating joining aids. By designing the part as a welded sheet-metal bent part, it is possible to cut the original costs of the part by a full 41 percent. And the coil holder can be made even cheaper by eliminating welding and just using skillful bending. This does require slightly thicker, more expensive sheet metal, but it slashes the manufacturing costs in half. And once the coil holder is assembled, its greater weight does not play a significant role. When designers know the breadth of options available to them, it’s easier to find the best design for their part based on the axiom of “form follows function”.



Thomas Bronnhuber,
Innovator & part designer
at TRUMPF Part Design

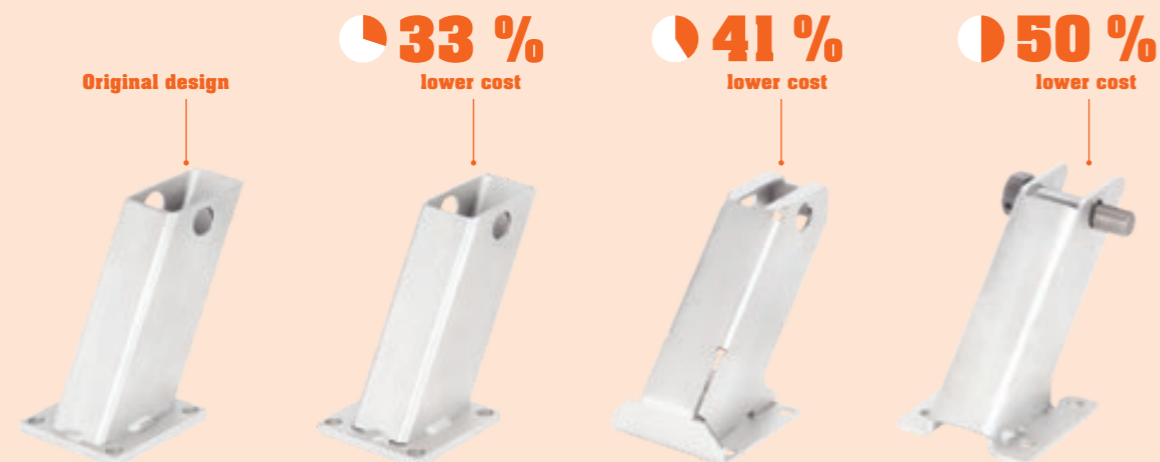
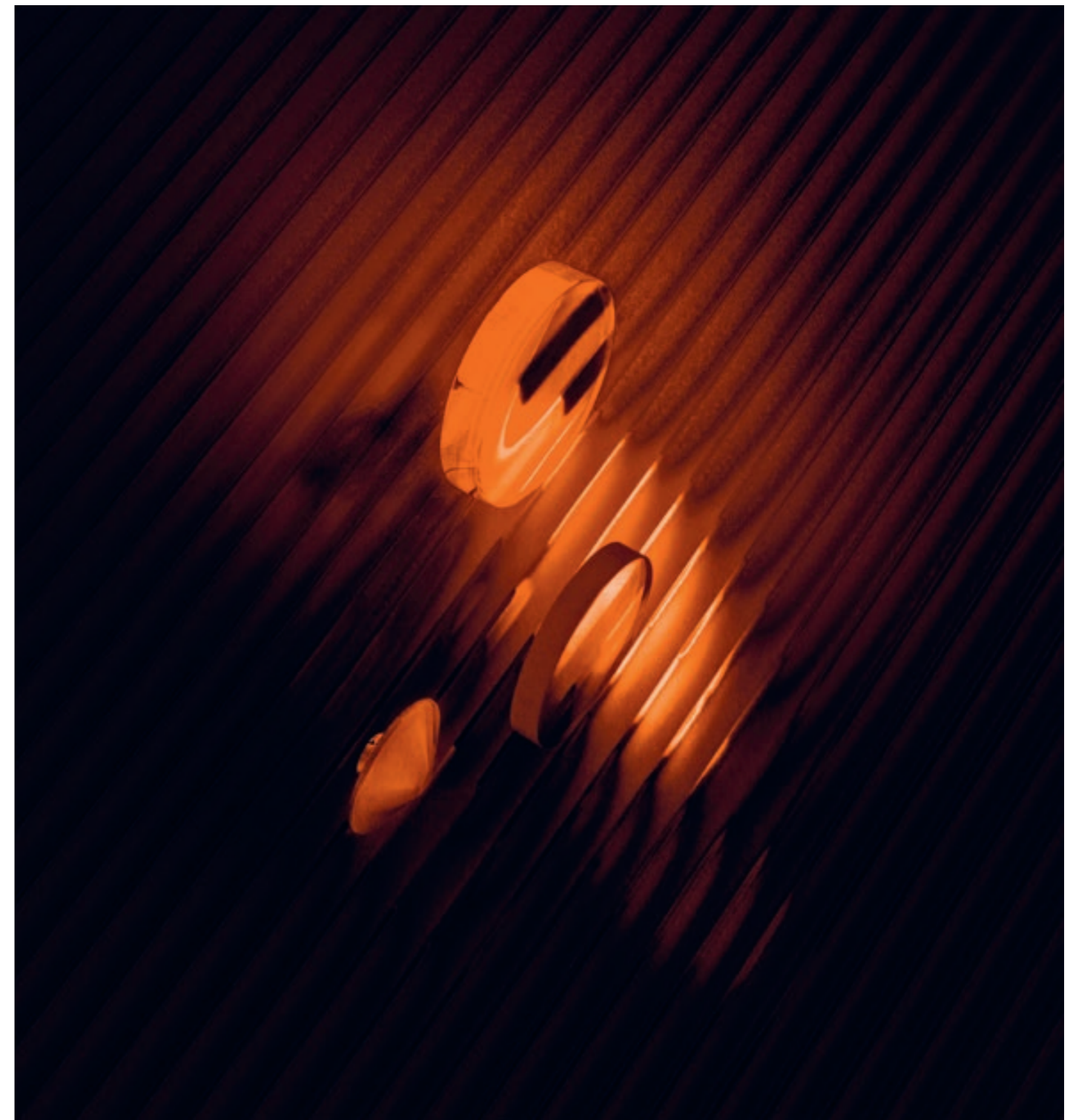


PHOTO: TRUMPF

#18

pARTgallery



This picture shows a **protective glass, a lens and a nozzle** in a way we’ve never seen before. The protective glass keeps the lens free of debris and contamination in solid-state laser machines and systems. The cutting nozzle focuses the laser beam and cutting gas on the workpiece. By taking these parts out of their familiar environment, photographer **Dennis Adelman** helps us see them from an entirely new perspective.

Focus on people

Sometimes even the most successful entrepreneurs talk a lot of nonsense. So when someone demonstrates the kind of steely focus that actually produces results, it's time to sit up and take notice. Elon Musk is one of those people. His list of accomplishments is truly remarkable, ranging from PayPal, SpaceX and Hyperloop to StarLink, Tesla and even OpenAI, which created ChatGPT. Musk parted ways from this latter organization several years ago, but he was one of its main backers in its early days as a not-for-profit research project. According to his own estimates, he invested somewhere in the region of 50 million dollars in the OpenAI project – and he even claims to have come up with the name.

Musk's ventures tend to have a pretty clear focus. The primary objective of his space company, SpaceX, is to colonize Mars. In his race to achieve this goal, he has ended up revolutionizing space travel by harnessing reusable rockets to drive costs down. At the same time, Musk has used Tesla to shake up the entire global auto industry. Whatever direction automakers decide on in the years ahead, Tesla has undoubtedly supercharged the mobility revolution, even though the company was initially ridiculed. Meanwhile, Musk's StarLink satellite system has opened up internet access



Jürgen Brand

to remote areas hit by natural disasters and has even provided assistance to Ukraine.

However much we may disagree with some of the decisions taken by this highly-driven serial entrepreneur, the truth is that all successful businesspeople lose their focus every now and then. It's all part of the risk-taking that forms part of entrepreneurship. Some may shy away from it, but it's essentially what every responsible entrepreneur should be doing.

In today's society, there is a strong temptation to be evasive and non-committal, yet the ability to maintain a steely focus is more valuable than ever. It can be tough to stay focused nowadays, or even to find the right thing to focus on in the first place. Faced with challenges such as the energy transition, the climate crisis and escalating bureaucracy, companies must be careful not to lose their way. Sometimes experts simply have to accept that their approach "is only fit for the scrap heap", as one automation expert helpfully put it during research for this issue.

If there's one thing history and numerous successful projects have taught us, it's that muddy, over-generalized goals and people's stubborn tendency to beat their heads against a brick wall are a painful combination – and that's when someone with a clear focus can help turn things around. No ambitious project ever got anywhere without dedicated and focused employees. And if you can manage to put a firm focus on a new product's long-term benefits, success is virtually guaranteed. Ultimately, whether you are part of a shop-floor team or in a management meeting, a no-nonsense approach is always the best way forward!



TRUe #18

IMPRINT

Published by

TRUMPF SE + Co. KG
Johann-Maus-Strasse 2
71254 Ditzingen, Germany
TRUMPF.COM

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Printed by

W. Kohlhammer
Druckerei GmbH + Co. KG

Solution to the hidden object game:





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71254 Ditzingen, Germany

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