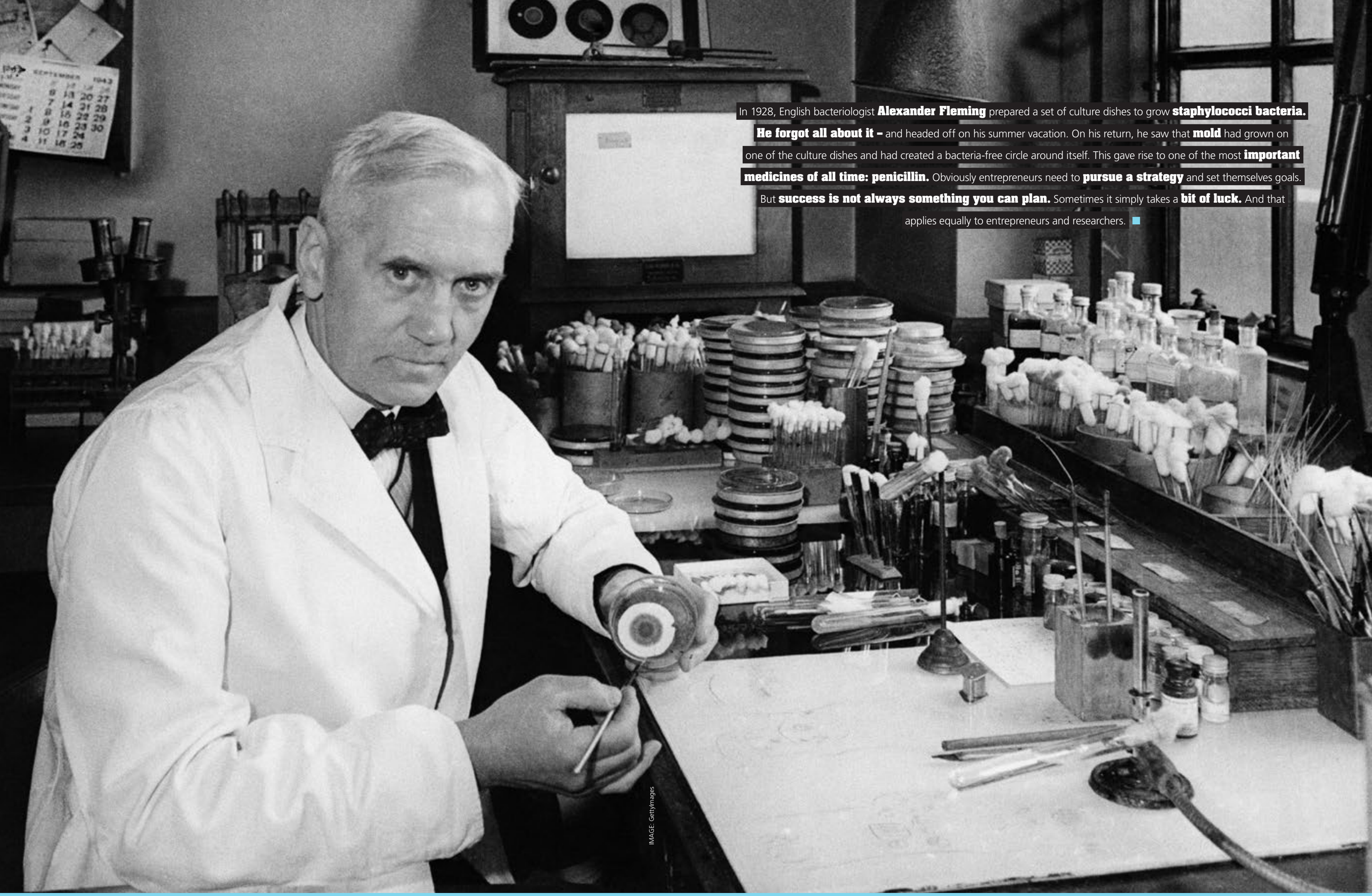
# TRUe

THE MAGAZINE FOR SHEET METAL EXPERTS



TRUMPF



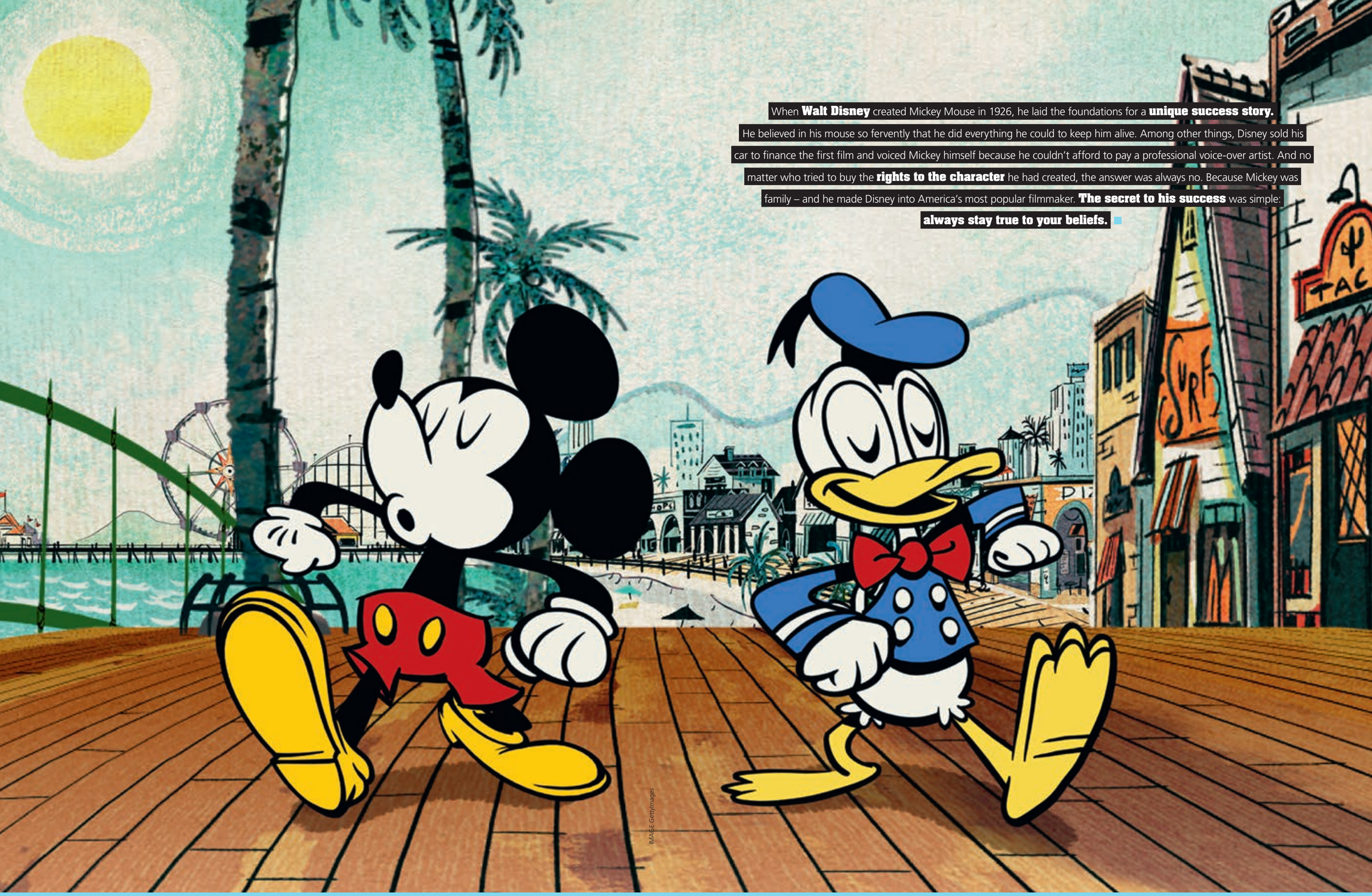
In 1928, English bacteriologist **Alexander Fleming** prepared a set of culture dishes to grow **staphylococci bacteria. He forgot all about it –** and headed off on his summer vacation. On his return, he saw that **mold** had grown on one of the culture dishes and had created a bacteria-free circle around itself. This gave rise to one of the most **important medicines of all time: penicillin.** Obviously entrepreneurs need to **pursue a strategy** and set themselves goals. But **success is not always something you can plan.** Sometimes it simply takes a **bit of luck.** And that applies equally to entrepreneurs and researchers.

IMAGE: Getty/Images

Orcas are **pack animals.** And that **makes them very successful** hunters. By applying **skillful teamwork tactics,** they can even kill animals far bigger than themselves. This gives them a **major advantage,** especially in more **challenging hunting grounds.** So what can entrepreneurs learn from whales? If even creatures this big **seek out help,** then it's perfectly reasonable that we shouldn't always face every challenge as a lone warrior.

**There is strength – and often success – in numbers.** ■

IMAGE: GettyImages




When **Walt Disney** created Mickey Mouse in 1926, he laid the foundations for a **unique success story.** He believed in his mouse so fervently that he did everything he could to keep him alive. Among other things, Disney sold his car to finance the first film and voiced Mickey himself because he couldn't afford to pay a professional voice-over artist. And no matter who tried to buy the **rights to the character** he had created, the answer was always no. Because Mickey was family – and he made Disney into America's most popular filmmaker. **The secret to his success** was simple: **always stay true to your beliefs.**

IMAGE GettyImages


IMAGE: Steve Hall © Hall+Merrick



There's no magic formula for a **smart factory**. But help is available to find the right formula in each case – for example from our connected manufacturing consultants.

How do you define the exact moment when a company has successfully achieved digitalization? Personally, I don't think you can. It's simply not that black and white. Digitalization is a process that we'll be working on for many years to come, because new solutions are emerging all the time. But there's one thing we do know: digitalization will significantly increase productivity and profitability and make businesses far more competitive.

Digital transformation should be a step-by-step process. Choosing which steps are necessary depends on where the company is starting from – and the scope of possibilities is huge because every business is unique. The companies presented in this issue are a good example. The goal is a smart factory in which workflows are transparent and increasingly automated, creating a situation where single parts can be produced flexibly and at mass production cost. Each stage along the way needs to be tailored to the individual company concerned. So when our connected manufacturing consultants pay a visit to a customer, they take plenty of time to familiarize themselves with the processes involved and talk to the workers. That's particularly important when they are on a factory design "mission," for example when a company like Loka Metallverarbeitung is planning to build a new production facility on a greenfield site (p. 26).

We're also taking things one stage at a time in our own digital transformation. We have a specialized instructor in connected manufacturing who introduces new employees to the topic as soon as they begin their training. And in 2017, we brought our vision of a connected factory to life in the form of our smart factory in Chicago. Only two years have passed, but it has already welcomed 2,000 visitors to experience connected manufacturing first-hand.

Bringing connectivity to life was also one of the goals of the German Machine Tool Builders' Association at the EMO trade show in Hannover, where they presented the universal machine tool interface umati. On page 46, we talk to Christian Thönes, CEO of DMG Mori, about why this new interface is so important. I hope you enjoy reading this issue!

**YOURS, H.-JÜRGEN PROKOP**
Chief Executive Officer Machine Tools

TRUe

*Table of contents*

*#10/2019*

# SUCCESS...


## ...in Taichung City

01

A TRUMPF machine and a storage system: could that really be enough to take the first step toward a smart factory? Taiwanese company CHUN-LIN Laser decided to put it to the test – and the benefits came sooner than they had expected.

**Page 12**

## ...in Hüttenberg

Two successful companies, one challenging assignment: two become one. Why it pays to be nice to your neighbors – and how easy it is to put ambitious plans into practice when you have the right partners.

**Page 26**

03

BIZ+ SHORT CUTS 36


## ...in Caxias do Sul

70 years, 22 factories and over 11,000 employees: Brazilian company Randon could hardly be any more successful. Nobody knows the secret to their success better than Daniel Randon. He explains why loyalty is so important – and why you always need to know which way the wind is blowing.

**Page 18**

02

## ...in Ditzingen

TRUMPF is the only German machine maker to have its own bank. Managing Director Sabrina Mebus explains how the global economic crisis prompted TRUMPF to take such a radical step – and what role the company's employees play in the financing business.

**Page 32**

04

TEC+ SHORT CUTS 44

01

TAIWAN

*Success in Taichung*

# CATAPULT INTO THE FUTURE

Adding a TRUMPF machine and a compact storage system to the shop floor heralded a radical change for Taiwanese **laser specialist CHUN-LIN.** The **automated system** is the company's first step toward a smart factory. And success came faster than they had anticipated.

IMAGES: Sean Marc Lee, unsplash

**Instant chemistry:** Liang Sheng Chih was impressed by the TruLaser 3030 fiber right from the start. The new system has helped the company increase its turnover by 20 percent.


Liang Sheng Chih, general manager of CHUN-LIN Laser Co. Ltd., only has to glance at his production line to know that he made the right decision: in September 2017, he purchased a TruLaser 3030 fiber machine and a TruStore 3030 compact storage system and connected them together. And the change was remarkable. "Automation is one of the keys to our success. It frees us from external factors that might hold back our productivity. And, at the same time, it marks the start of our journey toward the future of manufacturing. To keep optimizing our processes, we need to gradually introduce smart factory solutions to our company. We've taken the first step – and things are really going to take off from here!."

## The tiger leaps again

Another place that has really taken off over the past few decades is his homeland of Taiwan. The country has changed dramatically over the course of a single generation, moving from an agricultural to a technology-based economy. In 2017, Taiwan's gross domestic product was 579 billion US dollars, putting it in 22nd place in the list of the world's largest economies and earning it a position as one of the Four Asian Tigers. The country's metalworking industry and companies such as CHUN-LIN have played a major role in this success story. Founded in 1998 with five employees and headquartered in Taichung City, this job shop has evolved over the past two decades into a specialist in the development and production of complex assemblies for the electronics, mechanical engineering and plant engineering sectors, as well as for the food industry. Like many other countries, Taiwan suffers from a shortage of skilled workers. That's why introducing automated manufacturing was such a crucial step to take, says Liang Sheng Chih: "Finding highly skilled employees is a difficult and expensive business. In the future, we will need to place them in the most critical roles and ensure that certain steps in the production process can also be handled by less skilled workers."

IMAGES: Sean Marc Lee


**CHUN-LIN** was founded in 1998 with just five employees. Since then, the job shop – which is headquartered in Taichung City – has evolved into a specialist in the development and production of complex assemblies for the electronics, mechanical engineering and plant engineering sectors, as well as for the food industry.

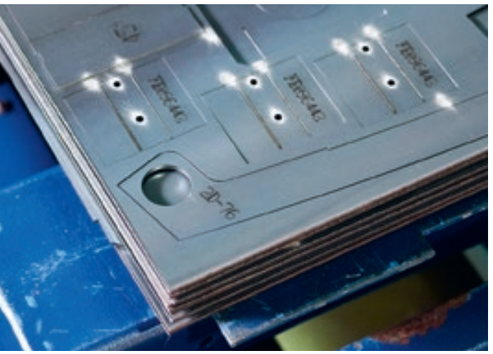
> " Our productivity has risen by **100 percent** since we installed the storage system. "
>
> Liang Sheng Chih, General Manager of CHUN-LIN Laser Co. Ltd

## Connect to succeed

CHUN-LIN opted to enter the realm of automated production by purchasing a TruLaser 3030 fiber machine connected to a versatile TruStore 3030 storage system. A dedicated pallet picker crane communicates with the machine's control system via the built-in storage system software. This allows the operator to input commands specifying where the crane should move and which materials are required. These two factors can be stored in the program to enable the system to operate without human intervention.

"The TruStore 3030 has optimized our flow of materials, saving us both time and space," says Liang Sheng Chih. "It has given us far greater transparency." Recent figures reveal the positive impact automation has had on the company: "Our productivity has risen by 100 percent since we installed the storage system," says Lian Sheng Chih with a smile. And he has plenty of other reasons to be enthusiastic: "The solution was ready to run as soon as it arrived, and installation was quick and easy. I can hardly imagine a simpler way to get into automated manufacturing! What's more, the system is user-friendly and doesn't require any specialist skills to operate. It offers us the flexibility we need to embark on our journey toward a smart factory." The TruStore storage system is a modular solution that allows users to connect additional machines and automation components.

The **versatile TRUMPF TruStore 3030 storage system** at CHUN-LIN features two storage towers with 31 pallets for large-format sheets measuring up to 3,000 x 1,500 millimeters.



## Automated production increases turnover

In addition to the TruLaser 3030 fiber and TruStore storage system, CHU-LIN also operates three standalone lasers from TRUMPF and a laser from a third-party provider, as well as one TRUMPF punching machine and four TRUMPF bending machines. The company also uses TruTops Fab manufacturing execution system (MES) software to provide greater transparency on the shop floor. Liang Sheng Chih says: "The software keeps me up-to-date with the status of all the jobs we're working on and gives me optimal control over the processes." The TruTops Monitor software module minimizes downtime by enabling operators to respond quickly to error messages, interruptions, malfunctions and idle time.

Lian Sheng Chih has already decided that they should continue down the same path: "We want to invest in a second storage system and an automated bending cell. The TruStore solution has shown us that automation not only makes us more flexible, but also more profitable. Our turnover is up 20 percent on last year's figure."


CHUN-LIN opted to enter the realm of **automated production** by purchasing a TruLaser 3030 fiber machine connected to a versatile TruStore 3030 storage system.

IMAGES: Sean Marc Lee

01

*key facts:*

# TruStore Series 3000

Taiwanese company **CHUN-LIN Laser** showed real courage by making a move toward a smart factory – and it paid off. The laser specialists have taken their production operations to a new level thanks to an **automated manufacturing cell** with a TruLaser 3030 fiber, a LiftMaster Compact and a TruStore 3030.

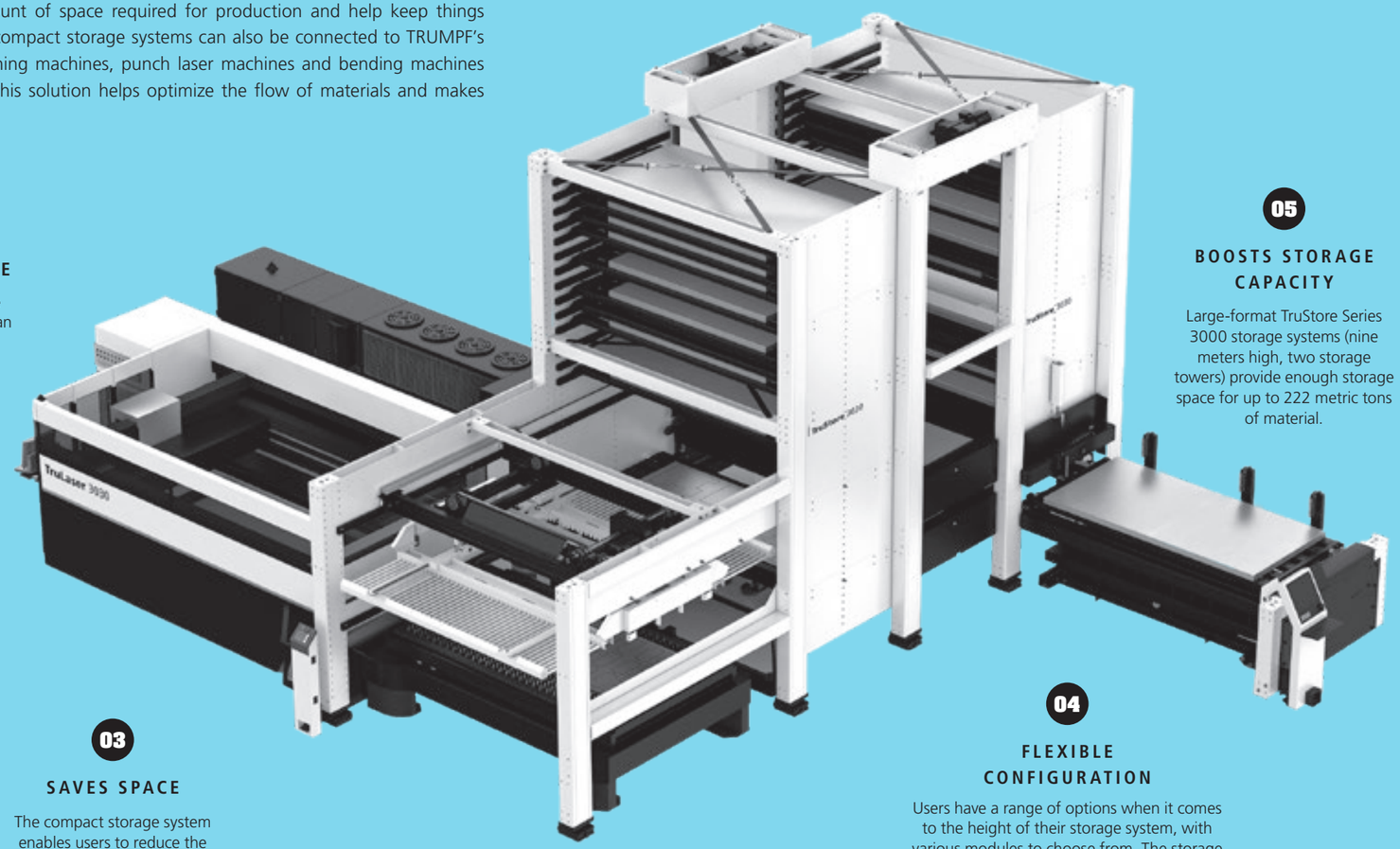
*In brief*

# Smart factory made simple

CHUN-LIN Laser took a big step forward into the realm of the smart factory. The Taiwanese company was helped on its way by the TruStore 3030. Here we take a closer look at this compact storage system.

## TruStore 3030

Storage systems reduce the amount of space required for production and help keep things organized. TruStore Series 3000 compact storage systems can also be connected to TRUMPF's 2D laser cutting machines, punching machines, punch laser machines and bending machines using automation components. This solution helps optimize the flow of materials and makes machine operators' work easier.



**01**

**MODULAR PRINCIPLE**

Additional modules, storage compartments and a tower can be added to TruStore Series 3000 systems.

**02**

**INCREASES MACHINE UTILIZATION**

TruStore Series 3000 systems can be used to run unmanned shifts – around the clock if necessary!

**03**

**SAVES SPACE**

The compact storage system enables users to reduce the amount of space required by up to 85 percent compared to conventional ground-level storage solutions.

**04**

**FLEXIBLE CONFIGURATION**

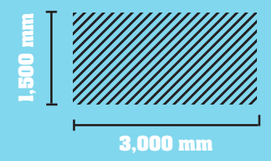
Users have a range of options when it comes to the height of their storage system, with various modules to choose from. The storage compartments are available with a standard loading height of 90 or 170 millimeters. Both pallets and containers can be used to store materials.

**05**

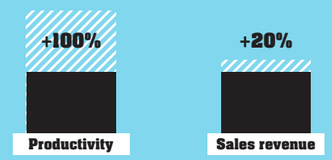
**BOOSTS STORAGE CAPACITY**

Large-format TruStore Series 3000 storage systems (nine meters high, two storage towers) provide enough storage space for up to 222 metric tons of material.


CHUN-LIN Laser machines some 75 metric tons of material a week, primarily mild and stainless steel between 1.2 and 12 millimeters thick.




The versatile TRUMPF TruStore 3030 storage system at CHUN-LIN Laser features two storage towers with 31 pallets for large-format sheets measuring up to 3,000 x 1,500 millimeters. Three pallets are used to store finished parts.




Since commissioning the TRUMPF automation solution, the company has seen a 100 percent increase in productivity and a 20 percent increase in sales revenue compared to last year's figures.

## About the customer

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## Machinery

- TruLaser 3040
- LoadMaster
- TruMatic L3050
- TruBend 5170
- TruBend V130
- TruPunch 1000
- TruBend 5230
- TruLaser 5030
- TruLaser 3030
- TruLaser 3030 fiber
- TruStore 3030

02

BRAZIL

*Success in Caxias do Sul*

# LESS GAS, MORE GAIN

Empresas Randon has over **11,000 people** working on the production of semi-trailers in southern Brazil. Now the company is upgrading its production facilities to make them **even more digital.** But one thing has remained unchanged over the past 70 years: it's the people who work there who are the **key to the company's success.**


IMAGES: Jefferson Bernardes, Eurico Salis e StudioM. Salco, Lucas Lermen

**Vast legacy:** Daniel Randon is the second generation of his family to lead the company that bears his name. And he's determined to safeguard its future.

One of Daniel Randon's most vivid memories of his father is seeing him stroll through the factory with his arms behind his back, stopping time and again to listen to workers. In 1949, Raul Randon opened a workshop together with his brother Hercílio in the southern Brazilian city of Caxias do Sul, where they specialized in overhauling engines for industrial applications. When Raul passed away in March 2018 at the age of 88, he left his son a "vast legacy", says the 42-year-old.

Vast is the right word: Randon is South America's biggest manufacturer of trailers and semi-trailers for trucks and trains. It also manufactures special-purpose vehicles and auto parts on a huge scale in a total of 22 factories. The Group includes ten companies, a bank and an 87-hectare test site. But, most importantly of all, it employs more than 11,200 people.

## Shared beliefs

Daniel Randon has been the company's CEO since spring 2019. "Running a successful business requires good managers and motivated workers who enjoy their work," he says. "Our motto is 'We are all Randon'. We see the people who work here as the true protagonists of Empresas Randon's success. They are our most valuable asset." This is an attitude he inherited from his father. "He always said that you can buy machines and raw materials anywhere in the world, but not people. That's why it's important to recognize their dedication and commitment."

Bernardo Bregoli Soares also remembers Raul Randon pacing through the company. "He was an amazing character," says the industrial manager. His colleagues Jeferson Rossi Fenner and Charles da Luz Pola from the tooling department nod in agreement. Pola joined Randon 12 years ago as a trainee when he was just 16 years old. He worked his way up and eventually gained his qualification as an industrial engineer with the support of his employer. "I have never worked anywhere else, and I can't see why I would want to! I have so many opportunities here," he says. On his smartphone he has a photo of the team's most recent Brazilian barbecue party, or 'churrasco.' Fenner has a similar story to tell. The 30-year-old engineer joined Randon as an apprentice when he was 18. He was offered a job – and has never looked back.

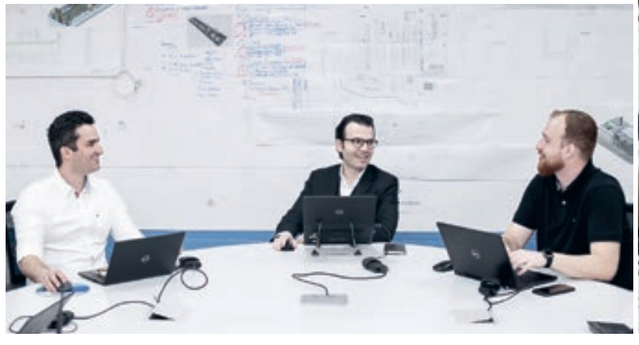
Soares, who comes from the same local area as his colleagues, spent time working in Germany and the U.S., but had already come across Empresas Randon in the course of his work. "I had a good feeling about the company," he says. It seems the feeling was mutual, because Randon ended up offering him a job. Two years ago, Soares returned to Caxias do Sul and now feels very much at home in the bustling open-plan office with the rumble of the shop floor directly behind it. A total of 120 finished trailers leave Randon's factories every day.

IMAGES: Jefferson Bernardes, Eurico Sallis e StudioM.Scalco, Lucas Lermen



" We see the people who work here as the **true protagonists** of Empresas Randon's success. They are our most valuable asset. "

Daniel Randon, CEO Empresas Randon



**A good team (left to right: Jeferson Rossi Fenner, Bernardo Bregoli Soares, Charles da Luz Pola):** switching to a different employer has never interested these three colleagues.


**Humans and machines:** Empresas Randon believes in a healthy balance between workers and technology, arguing that is the only way to make real progress.

## Staying on track

You might think that this is where the Empresas Randon success story comes to its logical conclusion, yet in fact it is only just beginning – or rather: continuing down the same track. Daniel Randon is now building on what his father began. In the process, he has revealed another trait he shares with his father: the ability to know which way the wind is blowing. In the 1950s, the Randon brothers sensed that Brazil's economy was growing. They reasoned that everything that is produced also has to be transported. So, from that point on, they decided to focus on the production of trailers and semi-trailers – and their instincts proved to be right. Yet Daniel Randon understands that past success doesn't guarantee future success. "Our goal is to maintain the leading role we have built up over seven decades. We want to achieve that by using cutting-edge technologies to produce innovative products while staying at the forefront of the latest trends," says the CEO, who is determined that he and his colleagues should push ahead with digitalizing the company's production processes.

> "We've found that we can produce as much with one of the **new laser cutting machines** as with three of the old ones."

Jeferson Rossi Fenner, Empresas Randon

This is reflected in the frequent conversations about new machines that Bernardo Bregoli Soares, Charles da Luz Pola and Jeferson Rossi Fenner have when they meet for lunch in the canteen. The three colleagues are making some major strides in improving the production facilities. By the time the project is completed in 2020, they hope Randon will be working with the biggest laser cutting system in South America, says Soares. The scale of the system won't be reflected in the overall machine count, however. In fact, the number of machines will fall: Randon intends to replace the 32 machines it currently uses to produce trailer parts with five TruLaser machines equipped with lasers of different powers. It will also be adding six TruBend bending machines and one STOPA storage system, which will be connected to the machines. "It will massively reduce our costs. We compared offers from three different providers. The purchase costs were very similar in all three cases, but it was the difference in operating costs that clinched our decision," says Soares.

## No alternative to innovation

How can the operating costs of the new TRUMPF laser cutting machine Randon now uses be so low? Soares and his colleagues argue it is mostly due to Highspeed Eco. Fenner notes that this cutting method allows them to reduce the amount of process gas they use during laser cutting by up to 30 percent. He also points to the increased productivity: "We've found that we can produce as much with one of the new laser cutting machines as we did with three of the old ones. Compared to plasma cutting, a TruLaser system can even produce six times as much!"

It's hard to know what the company's founding father Raul Randon would make of it – but he would probably say that the new machines form a good team with his valued Randon employees. Speculation aside, what is certain is Daniel Randon's insistence that production

**Enjoyable work:** many of Empresas Randon's employees – now numbering over 11,000 – joined the company as apprentices. The company's motto is 'We are all Randon'.



IMAGES: Jefferson Bernardes, Eurico Salis e Studio M.Scalco, Lucas Lermen

**A genuine team:**
Empresas Randon is one of the region's most popular employers. Workers often meet up outside the company, too – for example for a typical Brazilian barbecue party, or 'churrasco'.


**Big, bigger, Randon:** Each day, 120 finished trailers leave the production line at Empresas Randon. The company is South America's biggest manufacturer of trailers and semi-trailers for trucks and trains.

must be tailored to Industry 4.0: "It's a choice between being innovative – or being innovative. There's simply no other alternative." He says the same to the workers he meets as he takes one of his regular strolls through the company. Like father, like son.

> " It's a choice between **being innovative** – or being innovative. There's simply no other alternative. "
>
> Daniel Randon, CEO Empresas Randon

IMAGES: Jefferson Bernardes, Eurico Sallis e StudioM.Scalco, Lucas Lermen

02

*key facts:*

# Highspeed Eco and Active Speed Control

As part of a project to modernize its production facilities, the Brazilian family-run conglomerate of **Randon Companies** opted for **new laser cutting machines from TRUMPF.** Here we take a look at the features that help these machines make sheet metal processing faster and more autonomous.

*In brief*

# Fast, autonomous sheet metal cutting

## Highspeed Eco

Randon Companies opted to equip its new cutting machines with Highspeed Eco. This process makes use of a patented, touchdown nozzle to make cutting up to twice as fast while simultaneously reducing gas consumption. TRUMPF offers this cutting function not just for new machines, but also for older models.

## Active Speed Control

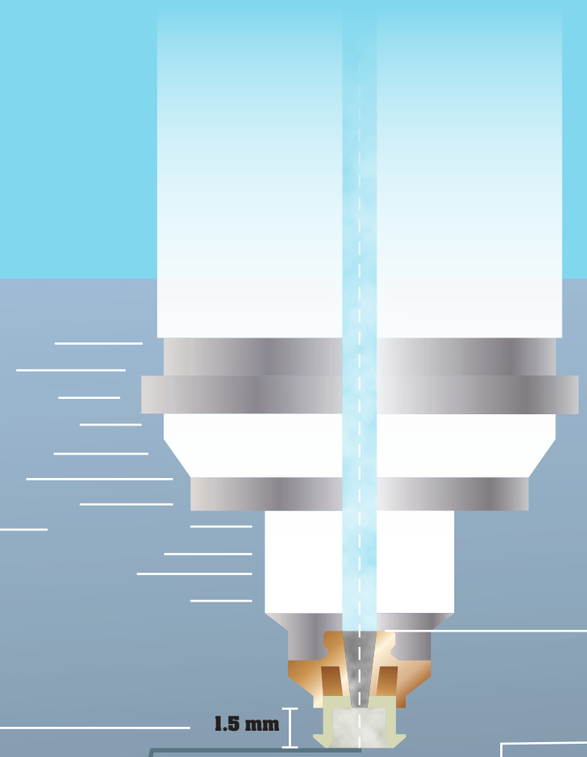
The Active Speed Control cutting sensor system is a key step on the road toward autonomous laser cutting. It looks straight through the non-reflecting nozzle right at the cutting zone, monitoring it in real-time and autonomously controlling the feed rate of solid-state laser machines. This function also makes the process more reliable, reducing scrap and rework.

### Free from interference:

Laser cutting with Active Speed Control makes use of non-reflecting nozzles. As a result, there are no additional reflections inside the nozzles that could interfere with the sensor system.

### 70 percent less cutting gas:

The touchdown nozzle's flexible sleeve ensures that little or no gas flows off to the side. Compared to conventional cutting methods, this process uses an average of 70 percent less cutting gas.




### Fewer cutting errors:

Miscuts can occur if the feed rate is set too high or too low. Active Speed Control combats this problem: the adaptive cutting speed prevents errors and reduces scrap.

### More reliable process:

As the flexible sleeve glides across the material, the nozzle remains at a distance of 1.5 millimeters from the sheet surface. This ensures the nozzle can pass smoothly and safely over any chips generated during piercing, minimizing the risk of damage.

### Reliable process:

Active Speed Control ensures optimum feed even when, for example, impurities such as rust or paint residues adhere to the material.

## About the customer

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## Machinery

- TruBend 5085
- TruBend 5230
- TruBend 5320
- 2 x TruBend 8800
- 4 x TruLaser 3040
- 2 x TruPunch 5000

03

GERMANY

*Success in Hüttenberg*

# COMBINED STRENGTHS

Merging two very different metal fabrication companies and leading them into a **successful future** is a major challenge – Tomas Loh and Matthias Kroll knew they would need some help – so they turned to the experts at **TRUMPF Smart Factory Consulting.**

IMAGES: Frederik Dulay-Winkler

As the rain eases off and a new day breaks, the scale of the devastation inflicted on the housing estate by the night's storm starts to become clear. With roads and paths blocked by fallen trees, Tomas Loh and Matthias Kroll set to work side-by-side, determined to clear up the mess and get things back in shape. That was in 2006. At that point, they had no idea that, years later, they would once again be rolling up their sleeves to set up a company together. Yet, even then, they instinctively felt they were on the same wavelength. And long after they ceased to be neighbors, they still kept in touch.

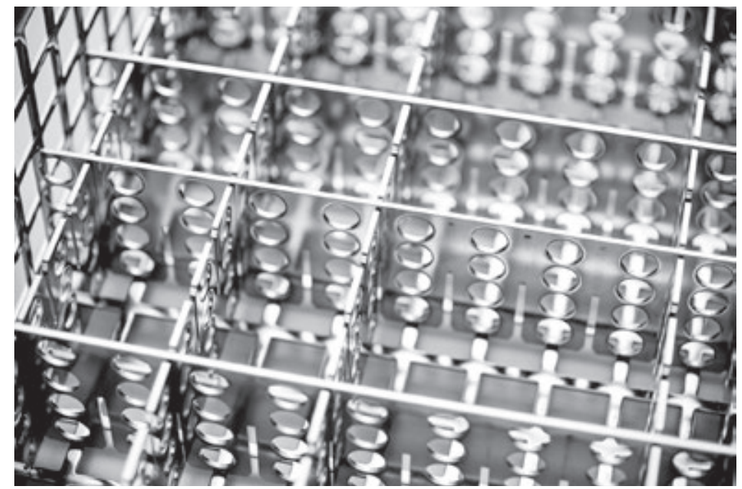
## It all fits together

At the time of that storm, Tomas Loh was already running a very successful company called LoKa Metallverarbeitung GmbH, headquartered in Hüttenberg, a town in the German state of Hessen. Having founded the company in 1995, he had gradually turned it into a specialist fabricator of stainless steel, steel, aluminum and sheet metal products. Today, LoKa offers not only traditional job shop manufacturing, but also complete assemblies for a number of different industries. And, from its earliest days, it has relied on innovative technologies. In 2015, Tomas Loh crossed paths once again with his former neighbor Matthias Kroll – and the timing couldn't have been better. Kroll, an engineer and specialist in drive and automation technology, was at a turning point in his career. "We discussed the idea of working together," says Loh. "We also took a detailed look at the strategic development of the company, not just in the office, but also over a glass of wine." Kroll came on board and, from that point on, they continued to grow the company in a joint leadership role. And when the successful duo was offered the chance to take over the company LK Mechanik und Blechverarbeitungs-GmbH, which is based in the nearby town of Heuchelheim, they barely even hesitated.

Much like LoKa, LK had also been using cutting-edge technologies since the 1980s to make products such as workpiece carrier systems for industrial and medical device applications. It had steadily built up a leading position in the international market – a position it continued to enjoy. Together with its customers, the company has spent many years designing high-precision automation solutions and setting new standards in the business. It now had a solid reputation as an innovative partner for challenging development projects.


IMAGES: Frederik Dulay-Winkler





**All shapes and sizes:** LoKa offers complete assemblies in the metal fabrication sector as well as intricate small parts for medical device applications.

## Two become one

Right from the start, Loh and Kroll knew they wanted to merge the two very different companies into one – and it soon became clear they were the perfect team to do it. "I tend to be the more hands-on one who is happy working away in the background," says Loh. "Matthias is tremendously skilled at dealing with customers from large global companies. He focuses on the business and sales side, but he also has a level of technical expertise that makes him the perfect point of contact for LK's projects, which tend to be long-term and require lots of consulting input."

After LoKa completed its acquisition of LK in February 2017, Loh and Kroll began to lay the foundations for a successful merger of the two companies. "There were big differences between structures, workflows and processes at the two companies in many areas," says Kroll. "On one side, we had LoKa's robust sheet metal fabrication business and, on the other, LK's complex and intricate part manufacturing processes. Combining those two things under one roof was a real challenge." What made things even more complicated was that the duo wanted more than just a straightforward merger. "We wanted to create synergies and unearth potential for future improvements," says Loh. "And that meant rethinking our entire production process." They soon realized the only logical step was to build a new facility.

**Stronger together:** Matthias Kroll and Thomas Loh are the perfect team. Well-trained workers and cutting-edge technologies are the key to their new production facility.

## Smart strategy for the future

Faced with this daunting task, Loh and Kroll decided to call on the assistance of the factory design experts at TRUMPF Smart Factory Consulting. "A team of consultants led by Sebastian Götz – our main point of contact – helped us scrutinize every single process at the two companies from every possible angle. They carried out all sorts of analyses to determine the current state of our production

" We wanted to create synergies and unearth **potential for improvements.** That meant rethinking our entire production process. "

Tomas Loh, managing director of LoKa Metallverarbeitung GmbH

processes and to identify weak points, dependencies and potential improvements. Then they developed a new, combined production strategy on that basis," says Loh.

"We were very keen for the consultants to take a holistic approach," adds Kroll. "We wouldn't have got anywhere if they had just analyzed our TRUMPF machines and systems. Sebastian Götz and his team are the kind of experts who have in-depth knowledge of the entire market, so they can evaluate machines and technologies that TRUMPF doesn't even offer! That's a major advantage over other consultants – and it was the deciding factor for us when it came to signing up for their factory design services."

Working together with the production and shift managers at LoKa and LK, Sebastian Götz and his team began by creating an 'ideal' version of the new LoKa production facility. The main focus in this step was to determine which technologies would be required for a desired level of growth within a defined timeframe and which machines, processes and digitalization solutions the company would need to achieve that. Next, they developed a step-by-step plan which the company is now working its way through. "That was the kind of approach we needed," says Loh. "Our goal was to create a situation that would allow us to not take any further steps for the next four to five years while still leaving the door open to expand the company any time after that."

Construction work on the new production hall is due to start in early 2020. As soon as the machines are safely in their new home and the processes are stable, Loh and Kroll plan to introduce the TruTops Fab production control system and the TruTops Boost automatic programming system. This joint planning process has steadily brought the LoKa and LK employees closer together. And – with the help of TRUMPF's factory design consultants – Tomas Loh and Matthias Kroll are confident they have laid solid foundations for their ongoing journey toward a smart factory.

IMAGES: Frederik Dulay-Winkler

03

*key facts:*

# TRUMPF Smart Factory Consulting

**LoKa's** managing directors knew from the start they needed a combined production facility – and that it needed to be smart. TRUMPF's **Smart Factory Consulting** team is supporting the company on its journey into the connected future. We decided to take a closer look.

*In brief*

# The journey toward a smart factory

TRUMPF offers support to customers from the initial concept right through to the creation of their smart factory. There is no one-size-fits-all solution, because each customer's journey is unique. The team of consultants hired by LoKa – a company based in the German town of Hüttenberg – opted for a three-pronged approach consisting of an analysis of potential improvements, factory design and transformation. We explain what that means and why the journey toward a **smart factory** is a marathon, not a sprint.

## The new production facility in figures:

**18,500**
$m^2$ of floor space

**36**
machines

**55**
employees

**Highlights**
Cleanroom for medical devices, automated laser welding, glass bead blasting

## Roadmap for a smart factory:

1

### Analyzing potential improvements

Every project starts with the same thing: an analysis of potential improvements. The TRUMPF consultants analyze and evaluate the entire process chain, including both direct processes on the shop floor as well as indirect processes ranging from customer inquiries to billing. They use these results to generate customer-specific recommendations on how to optimize the production process.

2

### Factory design

The next step is the custom factory design. The TRUMPF consultants work with the customer and their employees to plan a new, smart sheet metal fabrication process. The result – typically referred to as the ideal layout – is how the future layout would look under optimum conditions. Next, the consultants hold a workshop to plan the actual layout. Implementation of this layout may occur in different phases. The workshop participants define and specify the future processes, technologies and automation solutions. This allows customers to move toward their custom smart factory on a step-by-step basis.

3

### Transformation

The completion of the factory design marks the first step toward the smart factory. Customers now introduce the new processes, machines and software. TRUMPF Smart Factory consultants offer expertise and support in implementing the new solutions. Even once this stage is complete, the consultants continue to provide assistance and actively track the status of the project. Digitalizing manufacturing processes is an ongoing process, not a one-off task.

## About the customer

**LoKa Metallverarbeitung GmbH**
Managing directors: Tomas Loh, Matthias Kroll
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35625 Hüttenberg, Germany
Phone: +49 6441 444 666 0
Fax:+49 6441 444 666 30
info@loka-metall.de
www.loka-metallverarbeitung.de

## Machinery

- TRB V85X
- TRB V1300X
- TruLaser 3030

04

GERMANY

*Success in Ditzingen*

# JUST AN IDEA

Sometimes a crisis is a catalyst for **new ideas.** If one of those ideas takes root, it can turn into a success story. Take the **TRUMPF bank,** for example. It emerged from the international financial crisis and has been supporting its clients ever since, helping them with financing projects and facilitating their **journey toward digitalization.** Managing director Sabrina Mebus told us more about the bank's past – and its future.

IMAGES: Frederik Duay-Winkler

## 2009 Born from a crisis

The year is 2009, and the global economy is in trouble. TRUMPF's leasing company has been operating for eight years, and it has 400 corporate clients. They pay a monthly fee to lease TRUMPF machines. But when the crisis hits, around a quarter of them are suddenly unable to make the payments and fall into arrears of three to ten months. "We worked with our clients to restructure the leasing agreements, for example by lowering the monthly payments," says Sabrina Mebus, now managing director of the TRUMPF bank, and at that time employed by the TRUMPF leasing company. In the end, virtually all those clients survived the crisis, eventually even financing 155 new machines with the bank's help. In the midst of the crisis itself, nobody could have guessed that the leasing company would evolve into the first bank run by a German machine maker.

## 2014 From sheet metal to outgoing invoices

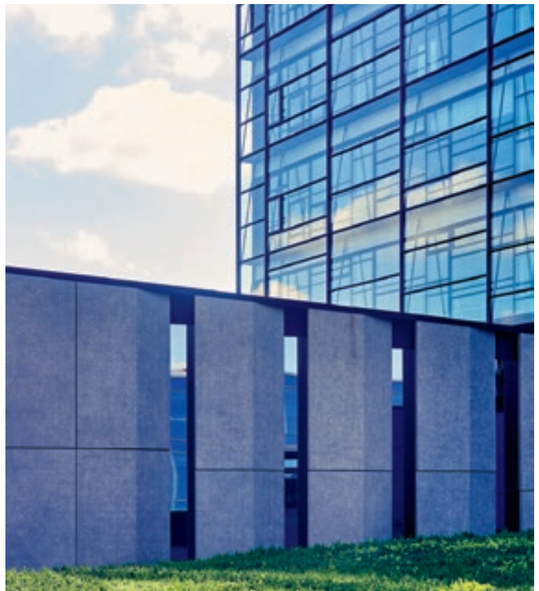
Sabrina Mebus' colleague Joachim Dörr was already managing director of the leasing company at that time. He had a vision. One evening, sitting in TRUMPF CEO Nicola Leibinger-Kammüller's office, he explained his idea: he and his team wanted to make the finance company more independent and provide their services to clients across Europe. The goal would be to support clients with a broad range of products along the entire value chain: from sheet metal to outgoing invoices. It took just 30 minutes for Dörr and Leibinger-Kammüller to sketch out the details of the "TRUMPF bank" project. At this point, of course, there was no guarantee that the idea would succeed. Led by Sabrina Mebus, the project team put together a business plan. The audit by the German Federal Financial Supervisory Authority (BaFin) and the Deutsche Bundesbank took fourteen months. Finally, in spring 2014, TRUMPF Financial Services acquired its banking license.

> " Our goal is always the same: to offer each customer the **best solution** to meet their needs. "
>
> Sabrina Mebus, managing director of TRUMPF Financial Services GmbH

## 2019 Banking on TRUMPF

"TRUMPF bank clients rely on the fact that everything centers around the machine," says Mebus, who has been co-managing director of the TRUMPF bank alongside Joachim Dörr since 2019, making her Germany's youngest bank director. "And at the TRUMPF bank, everything centers around our clients." It is a definite plus that the people who work at TRUMPF Financial Services also have expert knowledge of the machines. The team knows exactly what each customer needs and can offer them the right financing solution to achieve it. "We have a very special relationship with our clients. We are guided by our motto of providing excellent service, yet the bank can still make decisions independently of TRUMPF," says Mebus. Success at a bank is often measured by the number of loans made to clients. At the TRUMPF bank, the main focus is on helping customers to invest in a new machine.

To find the right finance solution, clients can turn not only to the bank's employees, but also to the 'Finance Manager'. "This is a helpful online tool that asks customers what they need from a finance solution – for example flexibility in making payments, or off-balance sheet financing. It then presents them with the most suitable finance product, even if that comes from one of the TRUMPF bank's competitors!" says Mebus. A market comparison with competing financial service providers is something of a unique feature in the banking sector. Despite the usefulness of this tool, personal interactions with clients continue to be a key part of the bank's ethos. "Making the decision to purchase a high-end machine is a big step," says Mebus. "We offer our clients the expertise they need."



Much has happened since TRUMPF founded its small-scale leasing company back in 2001. The current figures speak for themselves: 27 countries, 1,900 customers, 5,500 machines financed, and agreements totaling more than 2.5 billion euros. Each year, more customers join the bank and help further its success. Its client base even includes countries such as Colombia, where other banks would balk at offering finance products due to the high risk. In general, however, Mebus insists that "we feel it's important to be close to our customers."

As well as offering finance solutions, the bank also allows TRUMPF employees to deposit money. "The number of accounts has already reached 2,000," says Mebus. A deposit protection fund is in place to protect both private investors and TRUMPF customers. If the TRUMPF bank were to fail, the Compensation Scheme of German Private Banks (EdB) would repay customer's deposits up to the sum of 100,000 euros. The money deposited by employees helps finance the machines acquired by TRUMPF bank clients. "By depositing money in the bank, TRUMPF employees are actually helping provide our clients with finance solutions."

**All options open:** By working with cooperation partners, the TRUMPF Finance Manager is also able to offer customers finance solutions for everything from commercial real estate to fleet financing.

## Digital assistant paves way to future

The TRUMPF bank currently employs 28 people. They have achieved a tremendous amount on their journey from a leasing company to a bank. Now they are determined to ensure the bank continues to thrive in the digital age. "As well as projecting a modern image, we also want to make sure our internal processes are fully up-to-date too. That's our recipe for a successful future." With an ever-increasing number of customers and processes, digital tools and methods are proving to be a valuable aid. "For example, we're now using new software that helps us through the process of making an offer. It used to take us half an hour to draw up an offer; now that's down to five minutes!" Mebus' team is becoming more and more agile and digital. "We want to spend more time focusing on our customers and less on administration," says Mebus. What's more, the bank is working with an increasing number of 'fintechs', in other words start-ups in the financial sector. "They're showing us innovative approaches which will ultimately benefit our customers, too."

Another thing that is becoming more digital are the machines themselves. In line with its digitalization strategy, TRUMPF is connecting up more and more machines. This is also enabling the bank to explore new approaches in the leasing business: "We're planning to offer pay-per-use leasing schemes in the future." The TRUMPF bank already offers financing for third-party products as well as for its own machines. The online TRUMPF Finance Manager covers everything from commercial real estate to machines from other manufacturers and fleet financing – and more additions are on their way. "Regardless of whether the solution comes from us or someone else," says Mebus, "our goal is always the same: to offer each customer the best solution to meet their needs – both now and in the future."

IMAGES: Frederik Dulay-Winkler

04

*key facts:*

# TRUMPF Financial Services

TRUMPF Financial Services offers customers **flexible options** for financing state-of-the-art technology. We take a look at some of the options offered by the TRUMPF bank and explain how the **"Finance Manager"** helps clients make the right investment decision.

*In brief*

# TRUMPF bank: financing new technology

New machines and advanced technologies always require substantial investments. TRUMPF Financial Services offers its clients a range of **individually tailored finance solutions.** As a global machine maker and family-run company, TRUMPF is familiar with what its customers need and what the market offers. It helps customers plan their investments not only in personal consultation, but also through the **TRUMPF Finance Manager** tool. Here we take a closer look at the online tool and the various financing options.

## Leasing

Whether a customer is looking to purchase or make use of an asset, **TRUMPF Financial Services** can provide the most appropriate leasing options. Once the lease term expires, the client can decide whether to extend the financing arrangement or purchase the machine.

## Factoring

An invoice factoring service is also available. This allows companies to sell unpaid invoices to one of TRUMPF Financial Services' partners. The TRUMPF bank takes on the task of collecting the payments – and the company stays solvent.

## Personal loans

The bank also offers private individuals such as TRUMPF employees and customers the option of taking out a personal loan of up to 50,000 euros. This might be used, for example, to finance the purchase of a new car or restructure existing loans.

## Purchase financing

Customers who opt for a purchase financing solution can finance the goods and services of their choice with a payment period of up to 120 days. This does not affect their credit line.

## Financing

Clients can put together their own tailored financing solution and choose from a range of payment options.

## The TRUMPF bank: key facts

Founded in: 2014
5,500 machines financed
Only German machine maker to have its own bank
28 employees

## TRUMPF Finance Manager

The TRUMPF Finance Manager is an online tool that customers can use to calculate finance solutions in advance. All they have to do is enter the details of the planned investment. The Finance Manager will then calculate the various options at no charge. Customers can then log in via a secure connection to obtain an offer.

The Finance Manager can be used to calculate finance solutions not just for TRUMPF machines, but also for operating equipment, vehicles, commercial real estate and machines from other manufacturers, all of which the TRUMPF bank finances.

Find out more: **financemanager.trumpf.com**

BIZ+

# SHORT CUTS

*Fascinating facts and exciting innovations.*

6%

## Key figures

The TRUMPF Group increased its revenues to 3.8 billion euros in fiscal 2018/19, up around six percent on the previous year. TRUMPF continues to make most of its sales in Germany, with this fiscal year's figure standing at 721 million euros. Next in line is the U.S. at 547 million, the Netherlands at 460 million and China at 415 million (all figures in euros). The high figure for the Netherlands is primarily due to TRUMPF's partnership with Dutch manufacturer of lithography systems ASML. TRUMPF supplies specialist $CO_2$ lasers with which ASML systems produce chips of the latest generation. The company's global workforce also increased in size this fiscal year by eight percent to around 14,500.

The only disappointing figure from the fiscal year just ended is the slight decline in orders received, down to 3.7 billion euros, or three percent lower than in fiscal 2017/18. Nicola Leibinger-Kammüller, chairwoman of the group management board, cites various reasons for this, including the trade dispute between China and the U.S., the Brexit, structural changes in the automotive industry and a cooling economy in China.

## Apprentice 4.0

TRUMPF is systematically adapting its training programs to Industry 4.0. Starting this year, an "Industry 4.0 coach" has been providing support to all 65 new apprentices and students on the dual vocational training scheme at its location in Ditzingen and coordinating the digital content of the various types of training. This is the only position of its kind in Germany, and training manager Katja Tiltscher is convinced of its merits: "Our aim is to make digitalization a fundamental part of the learning experience. We are equipping our trainees and apprentices with IT expertise, practical know-how and agile working methods for the digital future."

## In-house lens making

TRUMPF now has the in-house capabilities to build the tools it needs for complex optics itself. On July 1, TRUMPF subsidiary INGENERIC acquired the market-leading manufacturer Aixtooling. The Aachen-based company employs around 40 people and specializes in ultra-precision molding tools for a process known as precision glass molding. This process is used to produce optics with complex geometries, primarily for laser and medical technology. This makes Aixtooling an excellent fit for INGENERIC, also based in Aachen and a leading manufacturer of micro-optics for high-power diode lasers and data transfer applications. The addition of precision glass molding gives the company the ability to perform yet another key part of the overall process chain itself.

IMAGES: TRUMPF, Spectrum Fotostudio


## Recommended reading

This fall, keen TRUMPF followers have plenty to read in addition to TRUe. The company published its latest annual report in October. This provides information on the company's economic situation at the close of fiscal 2018/2019 and recounts the 50-year story of TRUMPF's U.S. subsidiary, told against the backdrop of 50 years of U.S. history.
The latest issue of Laser Community #29 is also out. It focuses on the role lasers play in architecture and highlights a range of other exciting applications that harness light as a tool.

## Print ready

More and more industries are discovering the benefits of 3D printing. This was highlighted once again at the world's leading metalworking trade show EMO 2019 in Hannover, Germany. Thomas Fehn, General Manager of TRUMPF Additive Manufacturing, sums up TRUMPF's overall impression of this year's show: "Additive manufacturing technologies are proving their merits in more and more practical applications, so interest in such processes remains high." Fehn presented EMO visitors with two concrete examples: maxillofacial implants and satellite components. These are just two examples of how customers are breaking new ground with 3D printing in their industry sector.

## Simply digital – digitally simple?!

Recently, a number of companies joined forces to organize a special day-long event at the experimenta science center in Heilbronn entitled "Simply digital – digitally simple?! A fun way to understand my future". This event gave visitors the chance to experience and experiment with digitalization and learn more about how it relates to other areas – and it was the perfect opportunity for TRUMPF to get involved. Guided by TRUMPF employee Roy Knaebel, 14 ninth-graders developed and programmed sensors for use in the smart factory. In this way, they experienced just how exciting and varied digitalization can be.

# Turning a bankrupt business into a smart factory

**It took Ralf Stirl just one year to transform an insolvent job shop employing eight people into a flourishing business well on its way to becoming a smart factory. He relied on his farsightedness – and the TruConnect consultants from TRUMPF.**

Ralf Stirl knows a lot about steel processing and large welded structures – and he also has a good eye for promising investments. A brief visit was all he needed to recognize the potential of Schmidt GmbH, a company in Dahlewitz near Berlin that went bankrupt in 2016. He immediately purchased the business and renamed it FBT Feinblechtechnik GmbH. "They had an appealing mix of customers, including Deutsche Bahn, as well as good products and high quality production processes – and the eight employees had tremendous expertise," he says. But, right from the start, Stirl knew that the job shop would need some radical changes to succeed.

He had heard that TRUMPF was the market leader in sheet metal fabrication and decided that Ditzingen would be a good place to look into laser cutting systems. Browsing through an issue of TRUe, he came across an article about the TruConnect consulting service. "I regarded the company's fresh start as an opportunity to scrutinize every single workflow and process. When I read about TruConnect consulting and saw that TRUMPF had the right kind of machines, I quickly realized they could offer me the solutions and professional support I needed," says Stirl. He scheduled a meeting with Daniel Haller, a TruConnect consultant at TRUMPF, and the two of them began analyzing the company's production processes.

**Ralf Stirl** from FBT Feinblechtechnik GmbH is on the right track: his company is many times more productive today than it was just two years ago.

IMAGES: 5ter Stock



## Identifying areas for improvement

"Our first step was to analyze the indirect components of the production process and figure out where the logjams were," says Haller. He and his colleagues examined each and every step in the process, from customer inquiries, order confirmations and production planning to programming and outbound logistics. They focused on who does what and how, and which systems they use. At the same time, they mapped out a typical workflow based on a standard part. They started at the end, working backwards from dispatch and shipping and identifying the flow of information and materials from one step to the next, focusing carefully on how long each step took. "This gave us the information we needed on all the ways we could potentially optimize things," says Haller. "Like many small companies, FBT was keen for us to implement an initial set of measures as soon as possible. So that's what we did."

## Sorting things out

The first step was to optimize the process flow by reconfiguring the layout of the production facility. The team applied lean management principles to reduce waste in the processes to a minimum, shortening the distances workers had to cover, and eliminating time spent searching for things. "It may sound obvious, but an orderly, well-structured production facility is an essential first step on the path toward connected manufacturing and a smart factory," says Haller. "Instead of simply telling us what to do, TRUMPF helped us to help ourselves," says Stirl. "Their consultants presented potential solutions that our employees could examine, discuss, develop and, ultimately, implement."

In March, the team at FBT began using their new TruLaser 3030 to cut thin sheets and blanks to size, instead of purchasing them from a third party. The machine is programmed using TruTops Boost software. This is the perfect solution for FBT, because it makes the system easier to use and automates all the calculations.

Ralf Stirl is delighted with the results: "External procurement used to take anywhere between five and 15 days. Now we get the job done within 24 to 48 hours, which is the market benchmark for cutting and bending."

## Smart factory potential check

There is no one-size-fits-all solution to the challenges of the connected future. That's why TRUMPF offers customer-specific solutions, optimizing the process steps that offer the greatest potential for connectivity in each case. In just a couple of clicks, the Smart Factory potential check allows users to see exactly what options TruConnect offers.

https://www.trumpf.com/en_INT/products/smartfactory/

*Check it out!*

# SMART IN CHICAGO

In September 2017, TRUMPF opened its **Smart Factory** in Chicago. Designed to focus on the entire process chain of sheet metal fabrication and autonomous production, the Smart Factory demonstrates the latest machines while simultaneously producing sheet metal parts for customers. TRUMPF uses the facility to showcase all the key TruConnect components included in its Industry 4.0 offerings. It gives visitors a chance to experience how a smart factory works and learn more about how they can apply this concept to their own business.

## 26 MILLION EUROS

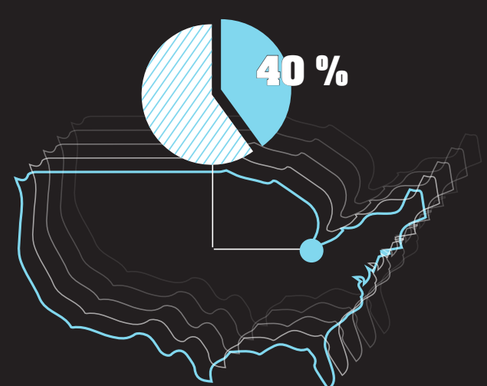
TRUMPF invested 26 million euros in the Smart Factory, some 13 million of which were spent on construction and roughly the same amount on equipment and machinery.

## 5,500 m²

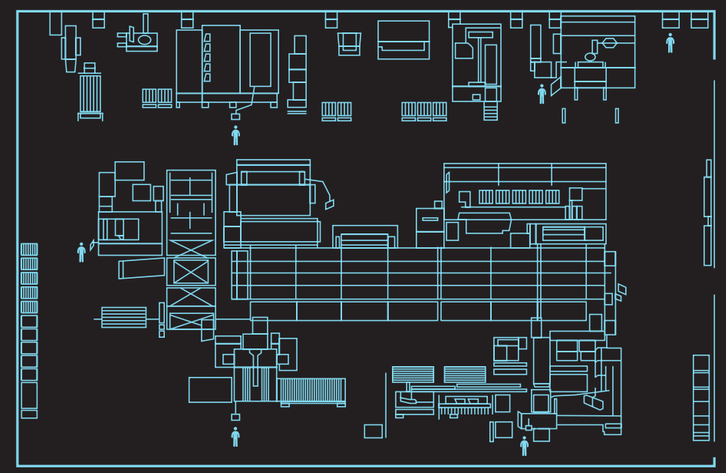
The Smart Factory has a total floor area of 5,500 square meters. It is staffed by 55 employees from all around the world.

## 55 employees

Chicago is the **perfect location** for the American market. It is one of the major industrial cities of the Rust Belt, the biggest and long-established industrial region in the United States. Some 40 percent of the U.S. metal processing industry is located in this area. Chicago is the control hub for all TruConnect software and automation products in the North American region.





At the **heart** of the Chicago location is the production facility. This is controlled entirely by TruTops Fab software.

## 24/7

The **Smart Factory** is a hybrid: in other words, it is both a showroom and a production facility at the same time. The goal is to manufacture parts around the clock, including fully autonomous unmanned night shifts.

## 2,000 visitors

2,000 visitors from 500 different companies visited the **Smart Factory** in 2018.

## Control room

Equipped with an array of large display screens, the **control room** shows visitors live, real-time production data in the form of performance indicators. The performance dashboards provide information on machine runtime, status and programs.

# Skywalk

The 'skywalk' has nothing to do with one of the main characters of a famous science-fiction movie – it forms part of the **steel roof structure** that covers the TRUMPF Smart Factory. Visitors can take a stroll along the skywalk to get a bird's-eye view of the factory in action.

**11** cross beams

**44 m** long

**220 t** total weight

# More internet for everyone 5G

**The new 5G wireless communications standard is often referred to as the biggest infrastructure project of our time. The technology promises virtually zero latency and super-fast data speeds. In this article, TRUe presents some key facts about the 5G network and explains why it offers such unprecedented opportunities, especially when it comes to connecting devices and machines.**

5G stands for the fifth generation of mobile internet technology. It is based on the current 4G network but runs on new and improved technology. The key figures for the new wireless communication standard speak for themselves: 5G will deliver data up to a hundred times faster while offering a thousandfold increase in capacity and latencies of less than one millisecond. This is equivalent to the time it takes a nerve cell to respond to a stimulus. If a surgeon were to use the 5G network to control a surgical robot in a different country, he would be able to move it in real time – without any noticeable lag.

## 5G is about more than smartphones

Think, for a second, of self-driving cars notifying each other about tailbacks and radioing ahead to the next set of traffic lights. Or machines and industrial robots that can be controlled from mobile devices just as if the user was standing next to the machine itself. Or the evolution of factories into modular, flexible production platforms. The 5G standard offers a huge technological leap forward for all these applications.

In many cases, 5G will eliminate the need for wired connections and the maintenance they require. This will give machines and robots far more freedom of movement. The new cellphone network standard has the potential to become a key milestone on the road to the much-heralded Internet of Things. Contrary to common belief, it could be of major interest to more than just smartphone users.

## Ready for the future

The 5G network can connect thousands of times more devices than its predecessor. This is important, because communication across wireless networks is already becoming more than just the domain of human beings. Machine-to-machine (M2M) communication represents an increasing proportion of our network traffic. Experts predict that more than 50 billion "things" – in other words devices with sensors – will be connected up in the Internet of Things by the end of 2020. The new wireless communications standard is designed to support this development. Germany plans to create a network of 500 5G base stations on freeways and major highways by the end of 2022, and some countries are planning to roll out 5G even faster. China intends to have over 10,000 transmitter masts in operation by the end of 2020.

It will still be a few years before we have a fully functional international 5G infrastructure, but one thing is already clear: comprehensive implementation of the new wireless communications standard will lay important foundations for developing numerous innovative technologies.



## Three questions

for Dr.-Ing. Christian Bauer, TRUMPF expert on 5G in the mechanical engineering industry

**01**

***Does TRUMPF already have specific plans for implementing 5G?***

There are still some questions about 5G's usability in industry that need to be addressed. That's why TRUMPF is currently focusing on committee work, for example through Germany's "Plattform Industrie 4.0" and in the "5G Alliance for Connected Industries and Automation" (5G-ACIA). As a founding member of 5G-ACIA, we're working together on the new 5G wireless communications standard with other industrial companies, equipment suppliers and wireless carriers and representing the interests of our industry. This is a great way for us to shape new technologies from the start.

**02**

***How will TRUMPF benefit from 5G?***

It's already clear that 5G will give the Internet of Things (IoT) a huge boost. TRUMPF machines are already capable of transferring data from sensors to the cloud. And data transmission speeds will get even faster with 5G. What's more, the new 5G mobile network could become the key transmission technology in production facilities and factories and between plants in different locations. That's obviously something that interests TRUMPF, too, because it will mean that companies can also establish private networks in the future with their own 5G frequencies.

**03**

***What would you personally recommend to companies that wish to use 5G in the future?***

Organizations should start by building up their knowledge of 5G technology and shop floor connectivity. Only then can they know the extent to which 5G will suit their purpose. However much hype there is around 5G, companies should still check on a case-by-case basis where this technology can deliver major added value and only implement it where it really makes sense.

" However much **hype there is around 5G,** companies should still check on a case-by-case basis what this technology can do and where it can deliver major added value. "

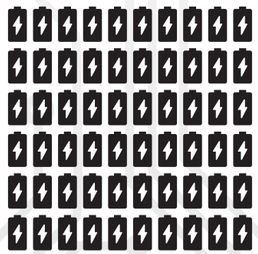
Dr.-Ing. Christian Bauer, TRUMPF expert on 5G in mechanical engineering

**23%**

***of the world's population is expected to have access to a 5G wireless internet connection by 2023.***

*(Source: Ericsson)*

IMAGE: TRUMPF

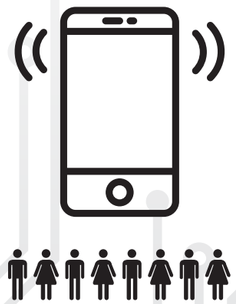



***5G requires only***

**1/1000**

***of the energy consumption per transmitted bit as compared to LTE technology.***

*(Source: Huawei)*



**50 bn**

***connected devices will be producing data by 2020.***

*(Source: Ericsson)*

**Global population of 8 billion people**

TEC+

# SHORT CUTS

*Innovations, technologies and future trends.*

## Getting automated

No space? No experience? No problem! With the TruPunch 1000 and TruMatic 1000 fiber compact laser machines, it couldn't be easier for users to enter the world of automation. Both machines can now be equipped with the SortMaster Compact unloading and sorting feature – without barely any need for additional space. All that is required is a slightly bigger safety zone around the machine. The SortMaster Compact is a user-friendly, versatile solution. Each suction cup can be individually controlled using the programming system. The suction cups at the front are smaller than those at the back. This makes it just as safe and reliable working with big, heavy parts as with those that have narrow tabs and small surface areas.

## Tool identification

From now on, every TRUMPF bending tool will come with a data matrix code that acts as a unique identifier. Scanning the code is all it takes to record all the necessary information. This makes it quick and easy for operators to insert tools in the ToolMaster (KB37) and set up tool stations. The code is included as standard on all upper and lower tools at no extra cost. To ensure the code remains visible in tough working environments, the marking is indented in the surface of the tool. This protects it against dirt and damage.

## Big help for workers

The new Workmate software solution from TRUMPF is aimed at one of the most important components of any company: the workers. Workmate uses tools from the realms of digitalization and Industry 4.0 to help both experienced and unskilled workers to work independently and efficiently and take the initiative where necessary. The software works on a tablet, cellphone or PC. It shows the machine operator or installer which jobs are on their to-do list, how each job has to be prepared and where they can find the necessary parts and equipment. It offers step-by-step support in achieving an optimal machine set-up while also providing safety tips. What's more, it provides the latest job instructions to ensure that the finished parts are removed, labelled and packaged correctly. Workmate helps employees organize their work, see how each job is progressing, track their own progress over the course of the day and avoid errors. Factory managers and companies benefit from the greater confidence and independence Workmate gives each individual on the shop floor – and that's not all. The software can also reserve and book goods from inventory. This boosts efficiency and quality as well as providing a quick overview of production status and throughput times. It also helps the production team react faster to new developments because everyone knows exactly what the next job is – and what capacity is still available.

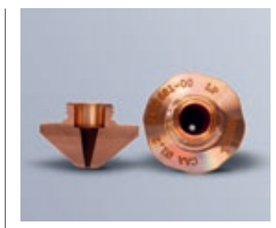
IMAGES: TRUMPF

## Try out and upgrade

TRUMPF's TruBend Series 5000 (B23) and Series 7000 (B28) bending machines come with a pre-installed demo version of the company's TecZone Bend software. This allows users to generate up to 50 NC codes at the push of a button, and at no cost. The software accesses 2D and 3D data directly in order to create a suggested program. The demo version also includes TecZone Bend's 3D simulation and collision monitoring features. To continue enjoying all these benefits, users can simply acquire the full version of TecZone Bend once the demo expires. This offers an additional advantage, because the full version can also be used offline on a PC, enabling users to create and modify programs quickly and intuitively while the machine is in operation.

## Maximum automation

Could there be anything more automatic than a fully automated system? If so, then the latest upgrade to the loading and unloading system for the TruBend Center 7030 panel bender would fit the bill! The machine can now be connected directly to a storage system and automatically supplied with blanks using a new transport cart. Traveling along rails, either elevated or embedded in the floor, the cart can deliver blanks to either the front or the side of the machine. The loading unit takes the blanks one by one, monitored by a double sheet detector and a separator. It can process multiple stacks in different positions and load the machine in parallel to production – in other words while the machine is producing parts. This marks another significant boost in panel bender productivity.



## New nozzles for smart cutting

TRUMPF has released a new range of nozzles for Active Speed Control. This feature allows solid-state laser machines to monitor cutting quality in real time. It works using a camera-based cutting sensor system. Looking straight through the nozzle, the sensor observes the light emitted during the process and analyses what it 'sees'. For this to work, it is important that no additional reflections are generated within the nozzle. This is ensured by a contour change precisely tailored to the cutting requirements as well as a darkened nozzle interior that prevents any reflections reaching the sensors.


05

THE FUTURE

# "AS NATURAL AS BREATHING"

IMAGES: DMG MORI, TRUMPF

**umati** is well on the way to becoming the **new Industry 4.0 standard.** At this September's EMO trade show in Hanover, the German Machine Tool Builders' Association (VDW) showcased the current development status of the interface, which connects machines and control systems from different manufacturers to their IT environments. TRUe talked to Christian Thönes, Chairman of the Executive Board of DMG MORI, and Heinz-Jürgen Prokop, CEO of Machine Tools at TRUMPF and Chairman of VDW, to find out why machine connectivity won't help companies stand out from the crowd for much longer – and how the new interface will benefit industry.

***Mr. Thönes, Mr. Prokop – what role does umati play at your respective companies?***

*Thönes:* Digitalization is key to the future of DMG MORI. We already offer our customers the option of digital connectivity for all our new machines as standard – that is, at no extra cost. This is the solution we presented to our customers at EMO under the banner of DMG MORI Connectivity, which provides a secure way of connecting up DMG MORI machines and selected machines from third-party providers. umati establishes the basis on which these machines can communicate with each other. By introducing this new interface, VDW has set an industry standard that is hugely important for the digital transformation of the entire mechanical engineering sector. This new standard makes production more reliable, easier to manage and more resilient to future challenges.


TRUMPF participated in the umati showcase at this year's EMO trade show along with other manufacturers. The company presented innovations such as the TruMark Station 3000 at the umati booth.

*Prokop:* It's crucial that machines are able to communicate with production control and other systems, but that's hugely challenging, as we've seen in our own parts manufacturing business. Integrating a new machine on the shop floor may sound simple, but it often necessitates a small-scale development project because each manufacturer has their own proprietary definitions. First, we have to learn how to read information from the machine's interface, and then how to render the data in our own system.

" It won't be long before we can link up every machine **in a network without too much trouble.** That's why I like to think of umati as a kind of USB interface for machine tools. "

Heinz-Jürgen Prokop, CEO of Machine Tools at TRUMPF, Chairman of VDW

umati will significantly simplify things in the future. In fact, it won't be long before we can link up every machine in a network without too much trouble. That's why I like to think of umati as a kind of USB interface for machine tools.

***And what benefits will it offer your customers?***

*Thönes:* Standardized interfaces such as umati make manufacturing easier for everyone involved. Let me give you an example: our modular workpiece handling system WH Flex allows users to piece together different technologies like a jigsaw puzzle, adding components such as chipping, post-processing or measuring. umati makes that even simpler – just connect together your chosen modules, and you're done! It's the best example I know of plug-and-produce.

*Prokop:* If you're keen to boost transparency and control production processes – and especially if you want to automate them – you need to do more than just get IT systems and machines talking to each other. You also need to integrate manual workstations and visualize the flow of materials. A great tool you can use for that is the Track&Trace system from TRUMPF. This provides on-demand updates on each job's progress and current status. The job automatically reports in to with the next workstation and can follow a paperless route through the entire process. Standards are needed to enable the quick installation and operation of these kinds of systems. Ultimately we're pursuing the vision of an autonomous factory, much like the automotive sector.

*Thönes:* That's how I see the future, too. In ten years' time, everyone will have forgotten about the challenges of connectivity. It will be as natural as breathing. Connectivity won't be something that makes a business stand out from the crowd for much longer. To stay on top, companies should already be opening up their machines to connectivity and thus, to a certain degree, to other companies.

IMAGES: DMG MORI, TRUMPF

***Is it also about gaining a competitive edge, for example over Asian manufacturers? umati obviously stems from VDW, which is a German association ...***

*Prokop:* Applying standards only gives you an advantage over competitors that choose not to use it. umati is a pre-competitive solution that will hopefully take hold worldwide. When I saw the VDW showcase at EMO 2019 in Hannover – where 70 manufacturers from all over the world connected more than 120 machines via umati – I sensed we're on track to achieve that. Production facilities often have machines from lots of different manufacturers, and you can only achieve real openness by incorporating each and every workstation. So companies that choose not to equip their machines with umati will be at a disadvantage in the future.

*Thönes:* VDW has set a good example with the umati initiative. At DMG MORI, we aim to provide guidance and orientation to our customers, which are primarily SMEs. Our goal is to take them step by step into the digital future with connected machines. But we can't do that on our own. When it comes to connectivity, we need complete openness, above and beyond VDW members. There's far too much exclusion and protectionism in the world as it is.

***So industrial machines will soon all be speaking the same language, but what does digitalization mean for us as human beings? Will there still be a place for face-to-face conversations in the future?***

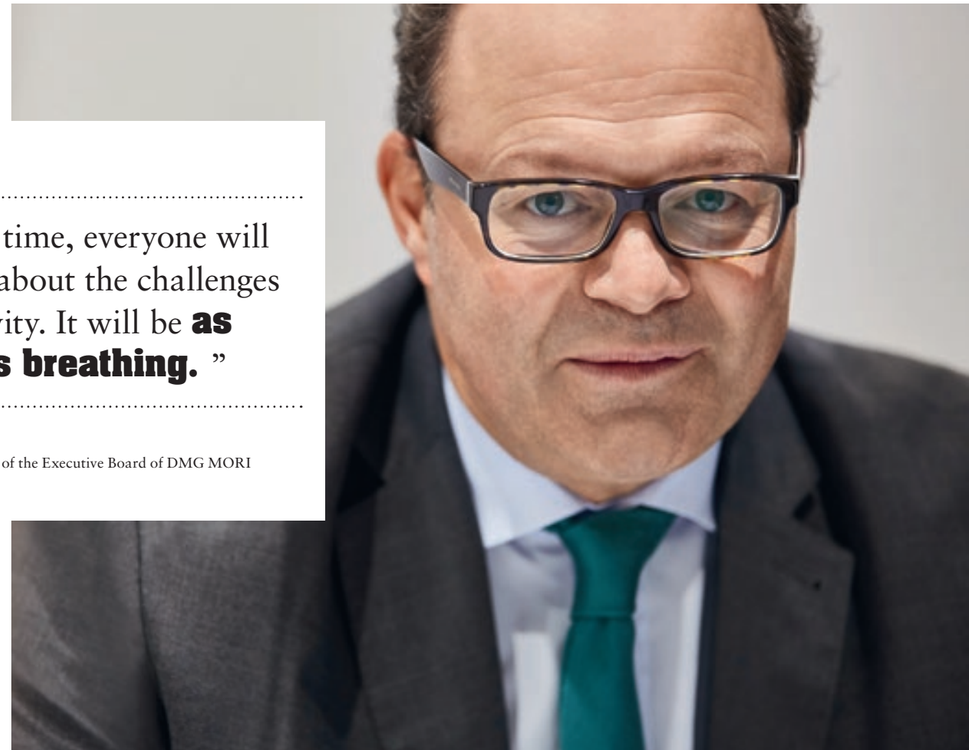
*Prokop:* A video conference can never entirely replace a face-to-face meeting. We've all experienced that sense of being able to communicate far more effectively when we're sitting across the table from someone – that's irreplaceable.

*Thönes:* Absolutely. Digitalization will certainly speed up how we do business. But it only makes sense when it goes hand-in-hand with human interactions. Face-to-face conversations will be just as important in the future as they always have been.

**Christian Thönes** (47) was appointed as Chairman of the Executive Board of DMG MORI AG on April 15, 2016. He is responsible for product development, sales and service, procurement, corporate communications, personnel, legal and audit. Thönes joined the group in 1998 and has been a member of the Executive Board since January 2012. During his time at DMG MORI, he has vigorously driven forward the fields of automation, digitalization and additive manufacturing. DMG MORI is one of the world's leading manufacturers of metal cutting machine tools, employing over 12,000 people. Its comprehensive technology and automation solutions include turning and milling machines as well as advanced technologies.

" In ten years' time, everyone will have forgotten about the challenges of connectivity. It will be **as natural as breathing.** "

Christian Thönes, Chairman of the Executive Board of DMG MORI



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# WE UNDERSTAND EACH OTHER

umati: it may sound more like a galaxy far, far away – but in fact it's the immediate future of mechanical engineering. The abbreviation umati stands for "universal machine tool interface", and it defines a common interface for machine tools from different manufacturers.

The current situation of proprietary interfaces makes it difficult – and sometimes even impossible – to connect machines made by different companies. Users who wish to digitally link up their machinery have to invest significant amounts of time and resources. But now the German Machine Tool Builders' Association (VDW) has decided to take steps to promote the connected future of the industry by launching the umati project. The VDW aims to establish a standard for connecting machine tools to IT systems in production environments. The idea originated at the international metalworking trade show EMO 2017 in Hannover. Eight partners from the mechanical engineering sector agreed to support the project.

## Transparent and efficient

Right now, one of the primary goals of the umati project is to standardize status monitoring. This covers various aspects including machine status, program progress reports, errors, malfunctions and tool management. Users all over the world can benefit from gaining greater insights into their machinery. umati reduces costs, provides a simple way to connect machines to existing IT solutions and opens up new avenues for the future of fully automated production.

## A common interface

Some experts have compared umati to USB, and they certainly have a point. After all, USB is also an interface that makes other types of interface superfluous, though USB applications fall firmly in the realm of computers and other household devices and appliances. umati's developers hope it will achieve the same thing in the realm of machine connectivity. umati is based on the open, international communication standard OPC UA, which enables different machines to access data using a common language. OPC UA defines how machines talk to each other by establishing a defined communication protocol, while umati controls which information machines share with each other. The umati interface provides a secure, seamless and user-friendly way to connect machine tools and systems to the machine operator's IT systems. This makes it simpler for connected machines to share information and ultimately makes production more efficient.

## Stronger together

Drawing on their accumulated expertise, the partners presented a preliminary version of a universal interface just one year after the project was launched. This early version of umati passed a key test at the AMB 2018 international exhibition for metal working, when 15 machines from nine manufacturers were connected to five control manufacturers and eight communication partners. The connected solutions included dashboards providing at-a-glance summaries of various metrics and manufacturing execution systems (MES) to improve production control. This year has now seen the completion of the next step in the process: the project partners took the opportunity of the EMO trade show in Hannover to showcase how machines can be connected together using umati.

More information is available on the following website:
*www.umati.info*

**umati partners:**

VDW research institute
**Machine tool manufacturers:**
DMG Mori, Chiron, Emag, Grob Werke, Heller, Liebherr Verzahntechnik, United Grinding, TRUMPF
**Application partners:**
GF Machining Solutions, Pfiffner
**Control suppliers:**
Beckhoff, Bosch Rexroth, B&R, Fanuc, Heidenhain, Mitsubishi, Siemens
**Supported by:**
The Institute for Control Engineering of Machine Tools and Manufacturing Units (ISW) at the University of Stuttgart



*#10*

# pARTgallery

**Technology transformed into art.** Presenting parts in a new light is something we do in every issue of TRUe. This picture presents a nozzle arrangement consisting of a nozzle holder, standard nozzle , slim nozzle, BrightLine nozzle and nozzle tool, together with a filter cartridge and mounting ring. By taking these genuine TRUMPF spare parts out of their familiar environment, photographer **Anne Schubert** helps us see them from an entirely new perspective.

# SUCCESS PROGRESS

## A success story in five chapters

Looking for the secret to success? You may find you're spoilt for choice! Take the 72-hour rule, for example. This tells us that if we postpone a pending task for longer than three days – 72 hours – we are unlikely to ever get it done. Meanwhile, the 10,000-hour rule tells us that anyone who wishes to achieve mastery in a particular area of their life must work hard for 416.6 days – or somewhat longer if you include breaks. The 90-90-1 rule suggests that we can easily achieve success if, for the next 90 days, we devote the first 90 minutes of our work day to one specific goal. And advocates of the 30-30 rule promise us success if we can spend 30 minutes a day working on a project that is not due for 30 days or more.

If all that sounds like too much, then you could try Jeff Bezos' "two pizza rule". The Amazon founder recommends never holding a meeting where you need more than two pizzas to feed the entire group. Admittedly he doesn't make clear whether those are mini or family-sized pizzas, but his recipe for success does have an appealing simplicity. When you have too many people in one room, they tend to spend most of their time satisfying their vanities, lengthily expounding their ideas and idly tapping away on their laptops. Research suggests the billionaire may well be right. According to U.S. social scientist Bibb Latané and his colleagues, eight people is indeed the maximum if you want to get anything useful done.

But the real secret to Bezos' success is his obsession with the idea that the customer is king. "The number one thing that has made us successful by far is obsessive compulsive focus on the customer as opposed to obsession over the competitor," said the richest man in the world in a talk last fall at the Economic Club of Washington. Bezos explained that Amazon had developed its "Prime" free delivery service because he knew that customers would love free delivery. Stock markets were less convinced, with analysts saying that Prime was too cheap to be profitable. But even if Prime led to a drop in the company's stock price in the short term, what Bezos achieved in the long term was locked-in customer satisfaction and substantial profits.

Ultimately, then, we should always remember to pay particular attention to our customers' problems. And don't be fooled into thinking that it's all about the big ideas, such as flying taxis to beat tailbacks, or automatic cookers that make your favorite meal at the touch of a button. Sometimes it's the supposedly minor things that help. Because most German people can't pronounce the name Citroën correctly, for example, the French automaker took the opportunity of its 100th anniversary this summer to rename itself in Germany as "Zitrön" – a far easier word for Germans to pronounce. The company put a huge effort into changing its logo, marketing articles and banners and used social media to inform customers and dealers about its rebranding strategy.

As you might have guessed, the whole thing was just a publicity stunt – but the huge media response soon had everyone talking about Citroën. What we don't know is whether more "Zitrön"s were sold as a result. If so, then we would probably have seen clever car showrooms quickly changing the names of other brands that German people find equally unpronounceable, such as Peugeot and Renault – all, of course, within that magic 72 hours!

Karl Thomas



## TRUe #10 IMPRINT

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