TRUe

THE MAGAZINE FOR SHEET METAL EXPERTS

23# 2026 ONE STEP AHEAD

TRUMPF

An eagle's **eyes are like high-tech cameras.** Even from several kilometers away, they can detect the slightest movement of their prey, spotting details that are completely imperceptible to the human eye. This ability gives the eagle a decisive advantage. It reacts before others even realize what is happening, staying that one crucial step ahead – an edge that helps ensure both survival and success. This offers a valuable lesson for businesses. Those who spot **trends, opportunities or risks** early can act, not just react. **Foresight is the secret to staying a step ahead.** Ultimately, it determines who identifies the right trends today – and comes out on top tomorrow.

IMAGE: Adobe Stock / KopoPhoto

On July 20, 1969, **Neil Armstrong** became the first man to set foot on the Moon – and the world held its breath. **Buzz Aldrin** followed a few minutes later, captured in an iconic image that symbolizes that triumphant mission to this day. Yet it wasn't an individual who created this extraordinary moment, but **an entire team:** engineers, scientists and visionaries who had spent years working toward this goal. The Apollo 11 mission proved that collective determination can help organizations stay one step ahead. Something that previously seemed unthinkable was made possible through **collaboration, trust and resolve.** The lesson for businesses is that a competitive edge is forged not by lone wolves, but by **collective energy.** When a team focuses on a common goal and joins forces, even the seemingly impossible becomes achievable – step by step, onward and upward to a new world.

IMAGE: Getty Images / Hulton Archive

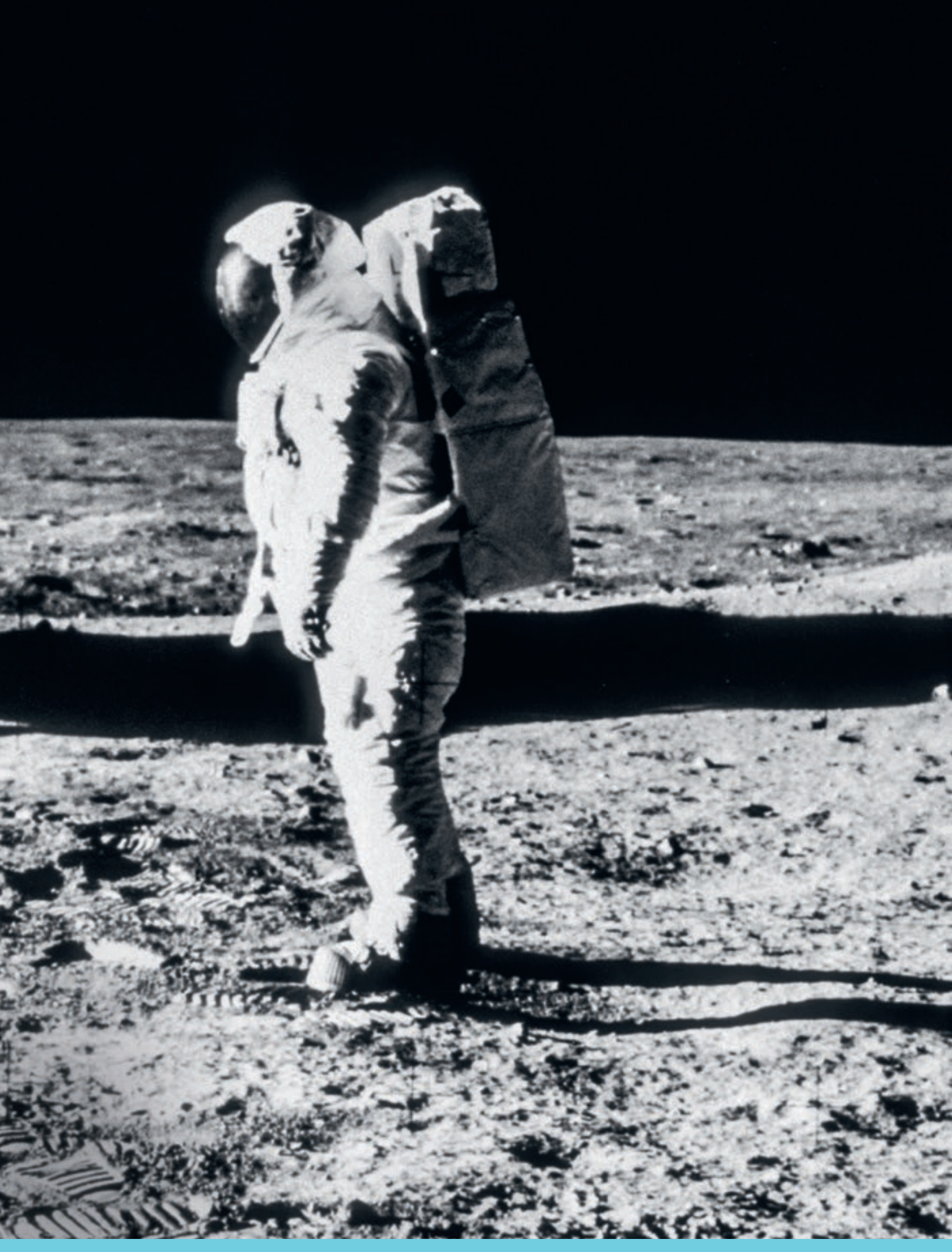
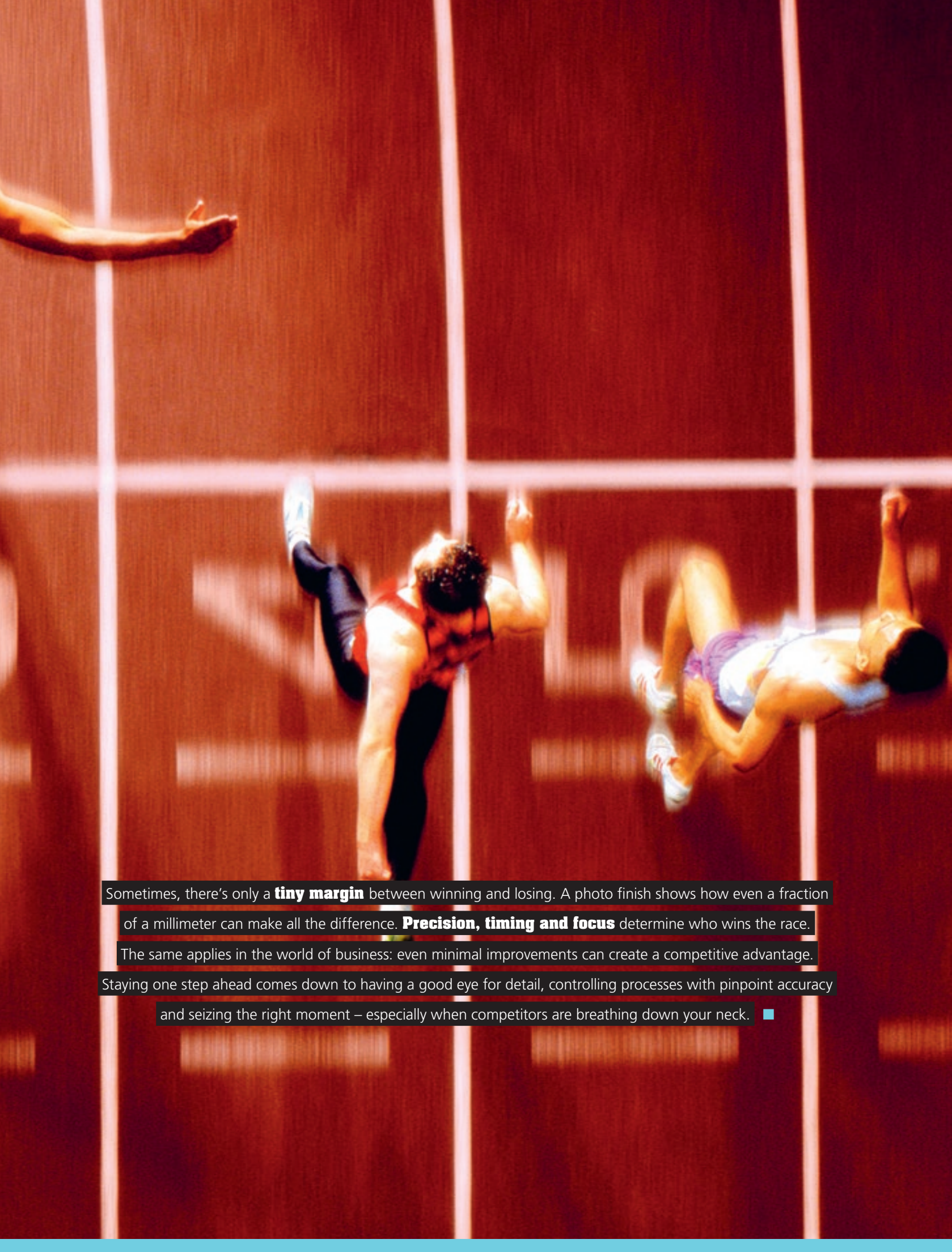


IMAGE: Getty Images / Alan Thornton



Sometimes, there's only a **tiny margin** between winning and losing. A photo finish shows how even a fraction of a millimeter can make all the difference. **Precision, timing and focus** determine who wins the race. The same applies in the world of business: even minimal improvements can create a competitive advantage. Staying one step ahead comes down to having a good eye for detail, controlling processes with pinpoint accuracy and seizing the right moment – especially when competitors are breathing down your neck. ■

IMAGE: Klaus Schwaiger, TRUMPF

Quality keeps you **one step ahead**

Dear readers,

This issue of TRUe is all about finding an edge and staying one step ahead. At TRUMPF, this isn't just an empty slogan – it's a commitment that shapes everything we do. As an innovation leader in industrial sheet metal fabrication, our stated goal is to develop technologies that deliver genuine added value to our customers – and enable them to stay one step ahead of the competition.

The keys to achieving this are digitalization and connectivity. Smart factories – where machines, software and material flow are smoothly and seamlessly coordinated – help address the shortage of skilled labor, boost productivity and ensure superior part quality. They help businesses confidently tackle challenges such as cost pressure, declining volumes and tight delivery schedules. Starting on page 46, you can discover exactly how our latest smart factory solutions work – and the key role played by our partner, STOPA.

A technological edge doesn't come from machines alone. Equally important is how well a manufacturer supports its customers on a day-to-day basis. As a solution provider, TRUMPF continuously invests in services that go well beyond standard offerings. We understand the importance of building long-term partnerships; at TRUMPF, we firmly believe that "sales sells the first machine, but service sells the second". We pride ourselves on supporting you around the clock with digital offerings such as Remote Control and Condition Monitoring – and getting your machine up and running again quickly in the event of a breakdown. With our Performance Check, we also help customers unlock the full potential of their machines. Using their machine data, we show them precisely where they can make adjustments to boost productivity even further. These insights often meet with an enthusiastic response (page 27).

At TRUMPF, this enthusiasm is also reflected in the quality of everything we do – our machines and technologies, our customer service, our choice of suppliers and every step of every process. In this issue, my colleague Johannes Böttcher takes you on a tour of our headquarters to show you exactly what TRUMPF quality means in practice (page 28).

The story of Kifix in Brazil provides a powerful example of the opportunities this creates for customers. After losing his job, Juarez Santini took the bold decision to set up a business manufacturing specialized clamps for welding work. He describes his two TruLaser Series 1000 laser cutting machines as the heart of his factory. The two systems operate with such precision that they have enabled him to stand out from the competition and achieve market leadership (page 12). A clear example of how outstanding quality can help ensure you always stay one step ahead.

I hope you enjoy reading this issue of TRUe.

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

TRUe

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Two generations working toward a common goal: Chen Lizhong and his son Chen Yuhao have transformed medtech company COMBED from a product manufacturer into a global solution provider. Their success is built on systems thinking, standards and a bold investment in TRUMPF connected manufacturing. Their story shows how staying ahead means consistently putting decisions into practice. One step at a time.

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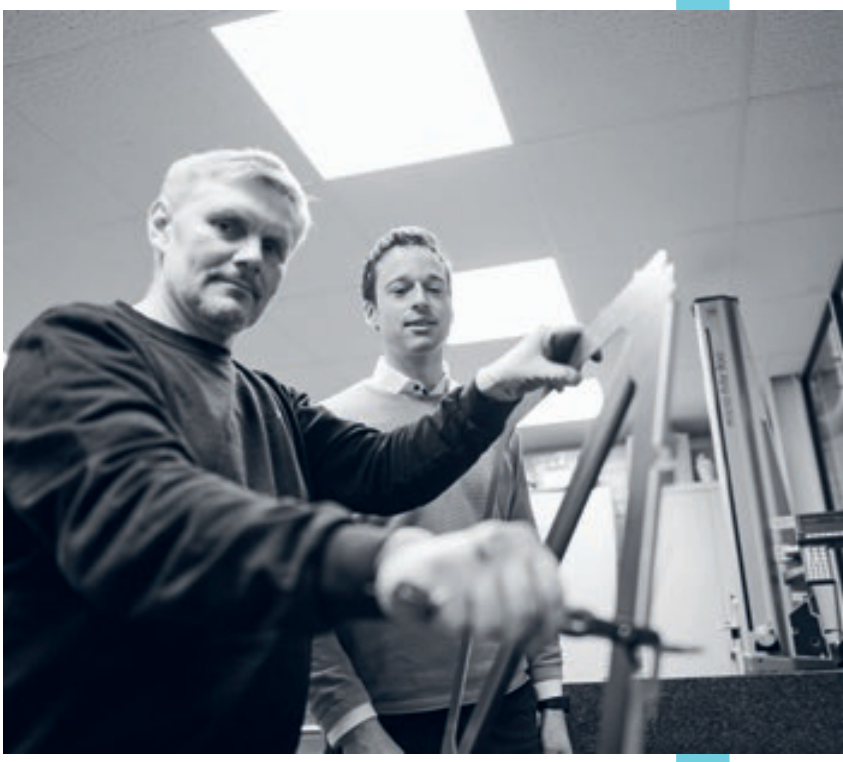
In 2004, Juarez Santini lost his job – and hit upon an idea. A casual inquiry led him to found Kifix, which today dominates the Brazilian market for toggle clamps, with a market share of some 80 percent. With courage, entrepreneurial spirit and TRUMPF technology, Santini and his daughter Caroline have built a company that shows how real success stories can emerge from crises. What drives them is finding opportunities where others fail. Every single day.



01

BRAZIL

Cutting edge in Caxias do Sul

KING OF CLAMPS

For **Juarez Santini,** the path to success began with an unexpected shock: in 2004, the family man from Caxias do Sul in Brazil suddenly lost his job as a sales manager. Fortunately, Santini is not the type to give up when crisis strikes. A man of action who prefers to take his destiny into his own hands, he decided to take a gamble and set up his own company, **Kifix.** Santini would subsequently go on to transform this business into **Brazil's market leader in toggle clamps.** And right at the heart of the company, he says, are his two TRUMPF laser cutting machines.

IMAGES: BALSA Produtora

Modern manufacturing: Juarez Santini and his daughter Caroline run a company that produces around 30,000 clamps every month. Packaging is fully automated, and production is carried out using TRUMPF laser technology.

One question changed everything

Home to over half a million people, Caxias do Sul is a vibrant industrial hub in southern Brazil, roughly 170 kilometres from the Atlantic coast and around 550 from the Uruguayan border. It's a well-known place in the Brazilian welding trade, familiar to anyone looking for reliable clamping fixtures. This is Santini's home turf, and it was here that he founded Kifix, the country's leading manufacturer of toggle clamps. It all started with a casual enquiry. Finding himself out of work, Santini initially struck out on his own selling tools. Then one day a customer asked for a specific type of clamp. This was uncharted territory for Santini, but he immediately commissioned a design and had the clamp manufactured at a job shop. The customer was delighted – and Santini even more so. He could see immediately that purpose-built clamping fixtures would give sheet-metal fabricators a serious competitive edge. And so Kifix and its clamping business were born. Its mission? To offer the right clamp for every welding job – whether large or small, heavy or light, square or round – and to support businesses across the full spectrum of professional welding work.

Clamping devices in 1,500 variants

Today, Kifix manufactures around 1,500 different products across a 1,500-square-metre facility equipped with state-of-the-art TRUMPF laser technology. Its core business is toggle clamps – more than 1,000 variants. "We produce approximately 30,000 clamps a month, and we have around 80 percent of the Brazilian market," says Felipe Gobbi, who heads international sales at Kifix. "Globally, we're on a strong growth trajectory. We deliver to more than 50 countries, including Uruguay, Chile and Mexico, as well as Europe and the US."

TRUMPF laser cutting machines have played a pivotal role in the Kifix success story. In 2012, Santini purchased a TruLaser 1030, which at the time was equipped with a CO_2 laser. That investment marked a decisive leap forward: Kifix no longer had to source punched sheet-metal parts from suppliers, because everything could now be manufactured in-house. "TRUMPF's high-precision laser technology helped us raise our game in terms of quality, product variety and performance. The finish on the parts improved dramatically, and it made us completely independent of suppliers," Santini says.

Precision-made powerhouses

"We have the strongest clamps on the market," says Vertriebsleiter Gobb. Kifix's most powerful clamp can exert a clamping force of up to 40,000 newtons – roughly the weight of an adult Asian bull elephant balancing on the workpiece on one foot. "Key to achieving this are the holes in the sheet metal; only TRUMPF laser cutting machines provide the precision we need to make the moving parts fit together perfectly and generate such high forces," says Gobbi.

Doubling down on productivity: from morning order to evening delivery

In 2021 and 2023, Kifix replaced its CO_2 machine with two TruLaser 1030 fiber systems. This is the perfect model for manufacturers like Kifix, who make large quantities of small parts. The modern solid-state laser makes this generation of machines both low-maintenance and highly energy-efficient, and Kifix was also impressed by the

Planning is everything: Kifix can deliver bespoke clamps to customer specifications in as little as ten days. With laser-based manufacturing, even small batches are commercially viable.

rapid cycle times. The quick-fastening clamp market is a fast-moving business, and many customers who place an order in the morning expect to receive the goods by the end of the day.

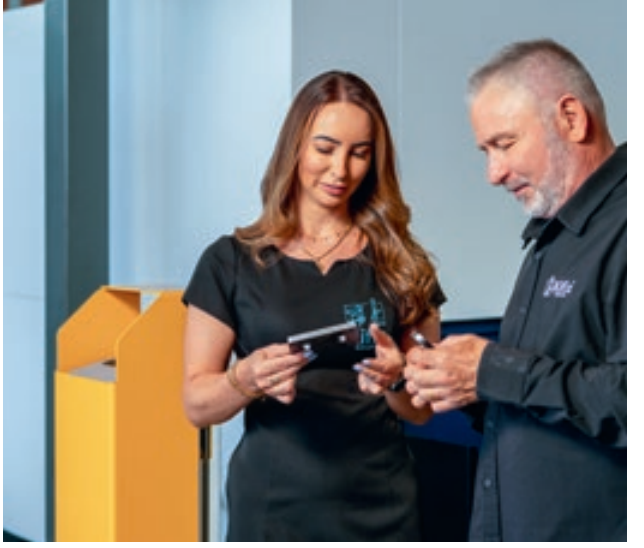
Laser tech makes custom clamps commercially viable

The TRUMPF machines also gave Kifix another unique selling point. "We're the only manufacturer of toggle clamps in Brazil that works with laser cutting machines," says Santini proudly. This gives the company a major edge in terms of flexibility, as a laser cutting machine can quickly adapt the part geometry or adjust the dimensions without the need for a tool change. "If a customer needs a bespoke clamp, we can deliver within ten days. We don't have to worry about minimum order quantities because even low-volume production is still commercially viable," he adds.

TRUMPF machines at the heart of the company

Santini was impressed by the precision, reliability and productivity of TRUMPF machines from the moment he saw them. And he immediately knew that the German high-tech company was the right choice.

"Our TRUMPF machines are at the heart of Kifix. We wouldn't be where we are today without them," says Santini. Without that investment, he feels the company would have gradually lost the ability to compete on price and part quality. Instead, it now sets the pace in the market, and Kifix is the yardstick by which other clamp companies measure their performance.



Focus on quality: Father and daughter both understand the importance of precision-made components. For Kifix, it's the key to making the strongest clamps on the market.

The success story continues

After 22 years running Kifix, Santini is looking to gradually step back from his leadership role. The next generation is ready to take the helm in the form of his daughter, Caroline. She began pitching in as a teenager after school, and now she is steadily taking on more responsibility as general manager. For her, one of the key benefits of the TRUMPF partnership is the after-sales service. "The support is first-class. With every machine we've bought, the team has always taken the time to tailor everything exactly to our needs," she says. With Caroline now part of the management team, her father's legacy is in safe hands. It's a success story that shows how a healthy dose of passion, courage and precision can lead to truly remarkable results.

> " Our TRUMPF machines are right at the **heart of Kifix.** "
>
> Juarez Santini
> founder and Managing Director of Kifix

Taking the reins: Caroline Santini is the next generation at the helm of Kifix.

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Maschinery

- 2x TruLaser 1030 fiber

IMAGES: BALSA Produtora

01

A closer look:

TRUMPF Series 1000: reliability at an entry-level price

Businesses are struggling with a combination of rising costs and fierce competition. Meanwhile, outdated machines and reliance on outside service providers diminish both flexibility and quality. The TRUMPF TruLaser Series 1000 Lean Edition and TruBend Series 1000 offer the perfect remedy: **robust, reliable, cost-effective machines** – compact, consistent and ready to run from day one.

In brief

Affordable path to precision work

TRUMPF's Series 1000 machines combine proven technology with a low upfront investment. The machines cut, bend and form reliably and economically, even when capacity utilization is low. They enable fabricators to tackle orders in-house without outside service providers while also reducing costs and safeguarding quality. **Easy to use** and requiring **minimal training,** this series of machines allows production to get underway without delay. Maintenance work is simple, too – without requiring a service technician or lengthy downtime.

TruBend Series 1000

The TruBend Series 1000 simplifies bending with TecZone Bend offline programming software – offering intuitive operation via the TRUMPF control panel – and a hydraulic upper tool clamp. The 4-axis backgauge ensures the sheet is positioned correctly, helping to ensure **accurate bend angles and consistent part quality.** Even complex parts are easy to bend on this machine series, while individually adjustable support brackets also allow operators to handle large, heavy parts ergonomically. With footprints ranging from 2.76 × 1.91 to 4.80 × 2.32 meters, these machines fit comfortably into many smaller shops. And thanks to their quick readiness for use and ease of operation, this series gives users the flexibility to respond quickly to sudden peak loads or additional orders – contributing to efficient, economical production.

TRUMPF's Series 1000 machines combine low investment costs with robust, reliable TRUMPF technology. They make laser cutting and bending economical, flexible, safe and reliable – directly in users' own shops.

Flexible and cost-effective

Both machine series allow fabricators to handle orders in-house, without outsourcing to outside providers. This gives businesses the flexibility to respond to customer requirements quickly and shorten lead times. By providing technical service, training and customized financing options, TRUMPF supports companies looking to increase their vertical integration with the Series 1000 machine lines. Ready to run from day one, the machines are a cost-effective option for new adopters or those looking to expand their bending capacity. The investment typically pays for itself within 12 to 24 months, depending on order volume and material mix.

TruLaser Series 1000 Lean Edition

With its six kilowatts of laser power, the TruLaser Series 1000 Lean Edition cuts sheets up to 25 millimeters thick **accurately and reliably.** The cutting unit is sourced from proven TRUMPF product series and features a reversible collision protection system: when a collision occurs, the cutting head gives way, deflects and stops immediately, thereby preventing damage to the cutting head. After a collision, the unit can be quickly repositioned by hand, and the machine is ready to get back to work. Patented nanojoints hold parts securely in the sheet to prevent collisions from occurring. Pre-set cutting processes for a wide range of materials ensure intuitive operation, with no specialized knowledge required. Thanks to its compact footprint and **low capital outlay,** the machine also makes economic sense at low capacity utilization. Efficient use of materials and energy helps minimize operating costs.

02

CHINA

One step ahead in Taicang

WHERE WISDOM MEETS CHANGE

Two generations, one goal: **COMBED** has evolved from a local manufacturer into a medtech company with a global mindset. Driven by systems thinking, clear standards and a bold investment in integrated manufacturing, the company has chosen to **focus on quality instead of competing on price.** For COMBED, staying one step ahead is the result of consistent decision-making.

IMAGES: Kore Studios

Two generations: Chen Lizhong and Chen Yuhao run COMBED together, combining experience, an international outlook and a commitment to quality.

When Chen Yuhao joins the video call, he is sitting in his car on the way to a business meeting. Despite being on the move, it's a stable connection with good sound quality. As we talk, Yuhao listens carefully and gives thoughtful answers while keeping his gaze fixed on the road ahead. Also sitting in on the call is his father, Chen Lizhong. Calm and composed, he maintains an unhurried air as our conversation unfolds. Two generations, two different speeds, one company – that's the mix that defines COMBED today.

Medtech manufacturer COMBED develops and produces hospital beds and integrated system solutions for hospitals, care homes and rehabilitation facilities. Today, COMBED employs around 150 people at its headquarters in Taicang. Chen Lizhong founded the company in 1998 after seeing hospital beds that were clearly no longer fit for purpose. With their simple technology and unwieldy design, they seemed largely unsuited to an aging Chinese population. "The beds were totally outdated," he says. "I knew something needed to change." So, he set himself the goal of rethinking beds to make them more functional, modern and automated.

Not competing on price

Initially, COMBED focused on selling individual products. But it was a tough market, and everything revolved around price. "If you just try to be cheaper than everyone else, you end up with really low margins," says Chen. He argues that competing on price leaves no room to invest in quality, R&D and process improvement – and quickly puts companies in a precarious position. The turning point came when hospitals made clear that they didn't want individual components – they wanted solutions. COMBED began helping customers design entire rooms and functional areas, from labor and delivery rooms to care and rehabilitation environments. Around 2012/2013, COMBED evolved from a product manufacturer into a solution provider. Technology and engineering were still firmly at the heart of its business, but the real added value lay in optimized processes.

A big step for the company came in 2021. Chen had been familiar with TRUMPF for years, partly thanks to his visits to European

> " We didn't buy just one piece of equipment – we built a **system.** It was the most important **decision** of my entire life. "
>
> Chen Lizhong, founder of COMBED

Precision: The TruLaser Tube 3000 cuts profiles with precision, eliminating several steps in the process.

IMAGES: Kore Studios

End-to-end processes: COMBED connects up machines, planning and material flow into a coordinated production system.

trade fairs. He admired the quality of their products, but he also knew that local machine manufacturers were much cheaper. Others might have been put off by the cost, but Chen saw the potential. COMBED invested some 30 million renminbi – roughly 3.9 million euros – in an integrated manufacturing system comprising a combination punch laser machine, automation, a storage system and software. "We didn't buy just one machine," says Chen. "We built a system." In retrospect, he describes this as the most important and far-reaching decision of his entire career.

It was a decision that fundamentally changed how the company operated. Old processes disappeared and the shop floor became more productive, precise and stable. Today, COMBED can produce the same quantity of finished parts with far less manual intervention than before. Repetitive and physically demanding tasks have been automated and the company has upped its game in terms of control, planning and process expertise. "Parts come out more accurately, with fewer errors," says Chen. Downtime is now less frequent, and new operators can be trained more quickly.

Precision that delivers results

At the heart of these improvements is the fabrication of tubes that form the structural backbone of hospital beds. From base frames and side elements to height-adjustment assemblies: precisely cut tubes determine whether parts fit together cleanly for welding – or whether rework is needed.

The company's TruLaser Tube 3000 runs around the clock. "Cutting parts with precision makes the next steps easier," says Chen. That's especially true for welding, and many of the tasks that used to take several steps have now been condensed into one. This saves time and improves the quality of the final product. The system is complemented by Oseon, TRUMPF's software for material flow and production control. Where production planning used to take up to two days, now it can be completed in a matter of minutes. "The system prevents a lot of manual errors," says Chen. Parts can be tracked, and workflows are more transparent. This means problems are spotted earlier – not just during assembly.

> “ In Germany, technical drawings are only one of **two** things: **100 percent right, or zero.** Good enough doesn’t make the grade. ”

Chen Yuhao, head of sales at COMBED

While Chen Lizhong is responsible for production and development, Chen Yuhao now heads up sales. The son brings a valuable new perspective that has pushed the company’s transformation to the next level. Determined to improve his knowledge by spending time abroad, he applied to a university in Germany and learned German. “It was a huge challenge at first,” he says, recalling how new everything was – from the language and culture to the style of teaching. But his experience in a country famous for inventors shaped who he is today.

He still recalls a comment made by one of his professors: “Technical drawings are only one of two things: 100 percent right, or zero”. This became a yardstick by which Chen Yuhao measures his work. “In Germany, there are standards for everything,” he says. “Good enough simply doesn’t make the grade.” To his mind, that means a process has either been thought through properly – all the way from design and planning to fabrication – or it hasn’t. A small mistake in a drawing can lead to rework, wasted time or quality defects once production is underway; that’s why manufacturers cannot afford to cut corners in the early stages. This is the approach he applies at COMBED today: clear standards in the design phase, structured production planning, and solutions that are spot-on from the start rather than needing fixing later.

Always one step ahead

Chen Senior and Chen Junior’s perspectives complement each other nicely, though that doesn’t mean they agree on everything: “We sometimes see things differently, of course!” says Chen Lizhong. “But we both put our cards on the table. And what’s important is that we always work out a compromise in the end.” The two men speak every week, combining experience with a fresh perspective. The values that guide the founder day to day are down to earth, with honesty at the top of the list. “Everything revolves around trust, whether you’re dealing with your employees or your customers,” says Chen Lizhong. Responsibility is also key, he adds, and decisions should make sense in the long term, not just in the moment. COMBED is based in Taicang, roughly 70 kilometers from Shanghai. Many German companies have set up shop here, and Chen Senior values this proximity as a key part of his strategy. “It’s a good place to find well-qualified workers,” he says. Some have previously worked in German companies and have a good grasp of structure and organization. That makes managing the team easier and aligns with the company’s own development.

Today, COMBED has a presence in the UK, with markets such as Japan and the US next on the agenda. Research and development are set to expand further, and Chen is well aware of how to stay one step ahead: “It’s a question of innovation: new processes and products that align with the market,” he says – plus the ability to take early decisions that have a long-term impact. His son has already arrived at his appointment and signed off, and now our call comes to an end. But COMBED is very much still on the move.

Leadership in transition: COMBED continues to evolve, shaped by two different perspectives.

Accurate every time: Precision-made parts ensure consistent quality in every series.

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Machinery

- TruLaser 1030 +LMC
- TruLaser Tube 3000
- TruLaser Cell 7040
- TruBend 1225
- TruBend Cell 5000
- TruPunch 5000 with SheetMaster
- STOPA storage system

IMAGES: Kore Studios

02

A closer look:

TruLaser Tube 7000: high performance in every dimension

Small profiles and large diameters. Single parts and high-volume runs. Precision and speed. These are the competing demands that tube fabricators navigate on a daily basis. The **new TruLaser Tube 7000** reconciles these opposing requirements – and makes a clean break with the limitations of the past.

In brief

A machine that strikes the right balance

The **new TruLaser Tube 7000** builds on what works. But it also adds an extra dimension for issues that pose the biggest challenges to tube fabricators on the shop floor: processing range, part quality, **productivity, process reliability** and **cost-effective production** in the volume segment. The result? A laser tube cutting machine that keeps on going when other systems reach their limits.

Cutting into a new dimension

The TruLaser Tube 7000 processes tubes and profiles ranging from very small diameters to large cross-sections. Its processing range now extends from an outer circle diameter of 12 millimeters all the way up to 290 millimeters. This performance gives users real flexibility, with the machine handling round tubes up to 273 millimeters in diameter, square profiles up to 203 × 203 millimeters and rectangular profiles up to 250 × 150 millimeters. The TruLaser Tube 7000 covers the bandwidth that job shops and product shops need day in, day out – all with a high degree of automation.

Cutting down cost pressure

The TruLaser Tube 7000 boosts productivity while driving down cost per part. Optimized workflows in the latest-generation control system keep production running smoothly, and the machine delivers impressively dynamic performance with fast transitions between sides and rapid contour lead-in. Combined with the RapidCut function and nine kilowatts of laser power, these features significantly improve output and guarantee maximum output.

Cutting through tough times

The system's nine kilowatts of laser power make nitrogen-cutting cost-effective for a greater range of tasks. Higher power allows fabricators to cut thicker materials with nitrogen, reducing secondary operations. Starting from a wall thickness of four millimeters, cutting speeds increase noticeably. With eight-millimeter mild steel, for example, feed rates can improve by up to 150 percent.

Cutting out rework

ScanLine uses high-precision light section sensors to measure and compensate for raw material tolerances. The new Quality Pilot assesses raw material quality and uses the results as a basis for determining whether additional ScanLine measurements are required and how frequently they should take place. Together, ScanLine and Quality Pilot reduce measurement cycles while maximizing productivity and part quality.

Cutting back process risk

The new ObserveLine Edge function reliably detects the contours of pre-punched profiles and precisely aligns the cutting program to them. This allows users to process their pre-fabricated or semi-finished profiles reliably and accurately – without manual alignment and without introducing process risk. That opens the door to new applications without adding extra work.

Cutting down sources of error

ObserveLine Comfort reliably monitors whether slugs from cut contours have fallen clear of the tube. This new function increases process reliability and part quality while significantly improving first-pass yield. At the same time, it reduces the need for manual rework after tube laser cutting.

Cutting scrap down to size

The TruLaser Tube 7000 can process tubes up to 9.2 or 12.5 meters in length and fully eject finished parts of the same length. Loading the machine with 12.5-meter stock significantly boosts material utilization, since optimized nesting reduces scrap. Users also benefit from more favorable purchasing terms when buying material in this length. Both these factors help significantly reduce material costs. For the first time, users can process long components continuously in a single machine and unload them safely afterward.

Cutting the risk of downtime

Condition Monitoring tracks key components such as the chuck and detects changes early. The system alerts operators before issues become critical, helping to support planned, proactive maintenance.

The new TruLaser Tube 7000 is built for fabrication shops that need to stay flexible, run both small and large batch sizes economically, and respond quickly to changing requirements. It combines power with precision and flexibility with stability, offering greater freedom in exactly those areas where fabricators are currently feeling the most pressure.

03

GERMANY

One step ahead in Erbendorf

FORWARD THINKER, FAST MOVER

IMAGES: Klaus Schwaiger

Over the course of two decades, **Peter Götzl** turned his solo metal-working business into one of Germany's most sophisticated high-tech job shops for **fully automated, digitalized metal fabrication.** Quick off the mark and always one step ahead, he pursued his bold vision while keeping his feet firmly on the ground. Along the way, he discovered a passion for TRUMPF laser tube-cutting machines that helped take his shop to the next level.

Gamechanger: When it comes to cutting tubes, Peter Götzl relies on TruLaser Tube technology from TRUMPF.

It's December 2017. Standing on Peter Götzl's desk is a Christmas card from TRUMPF depicting a jolly Santa Claus gazing over a futuristic production environment – TRUMPF's Smart Factory in Chicago. To some, a simple message of Christmas cheer; to Götzl, a tantalizing vision of industry at its best: connected, automated and efficient. Soon, he would be on a flight to the US, determined to experience it for himself. And the ideas he came back with would ultimately transform his company and his vision in even more exciting ways. Yet this story actually began much earlier. Not in Chicago, but in Erbendorf, a small town in northeastern Bavaria.

Entrepreneur in a hurry

Rewind to May 2005, and Peter Götzl is just 18 years old. With his master craftsman certificate fresh under his belt, he has just launched his own metal fabrication shop. Götzl reached this point

> " We're Germany's **biggest laser tube-cutting job shop** without a product line of our own. "
>
> Peter Götzl, owner, Metallbau Götzl

at breakneck speed, completing a quick apprenticeship and a mere two months as a journeyman before embarking on his master craftsman training. And now he is diving straight into running his own business. While many of his peers are still figuring out their plans for college, Götzl has set himself up in a 20-square-meter portion of a friend's milling shop and is already building his first handrails and fences. Buoyed by a government grant, this

Programmed for quality: Precision-engineered parts are created on screen, then cut by the TruLaser Tube 7000 with full automation and precision – almost twice as fast as the previous manual method.

one-man operation is short on capital but big on speed. Yet he wasn't always this driven. He was a shy kid, but periods spent working in his father's hotel and his grandfather's metalworking shop taught him what it means to be an entrepreneur. Yet however familiar he may be with working around the clock and doing everything himself, his new venture requires him not only to make things, but also to sell them, negotiate terms and – even more importantly – convince people he's the best choice.

> " The only substitute for experience is **hard work.** A successful business needs to offer **quality and on-time delivery.** "
>
> Peter Götzl, owner, Metallbau Götzl

As he approaches banks and customers, he realizes the downside of being such a young business owner: people are reluctant to trust him. "That was a huge challenge for at least a decade," says Götzl today. But it taught him a lot: "The only substitute for experience is hard work. And a successful business needs to offer quality and on-time delivery," he says. That was how this newcomer built his reputation – by offering reliable service and fast delivery times, one job after the next.

Laser technology opens up new horizons

By 2011, he finally had his own facility and was taking on more employees. But success brought its own challenges: the more railings or fences he turned out, the more decorative components he needed to go with them, from infill panels to post caps. Fabricating these parts by hand would eat up too much time, so he sourced them from suppliers as laser-cut parts. But the lead times were far longer than Götzl was comfortable with.

Instead of simply solving the supply problem, Götzl had a bolder idea: laser cutting. His first thought was to use a flatbed laser to fabricate decorative components in-house and save time. But when he asked his TRUMPF consultant, they suggested an even better solution that spoke directly to his core business: a TruLaser Tube 7000 laser tube-cutting machine. Götzl was immediately sold on the idea. And when he saw a live demonstration of the machine in the Ditzingen Customer Center, he knew he could use it to cut railings, stairs and balcony components far better and faster than anything a band saw and hand labor could do. That would put him ahead of his competitors, and ultimately attract new customers. But putting a TruLaser Tube 7000 to work and making it pay would require a new building and enough staff to run multiple shifts.

So, in the spring of 2014, construction began on shop number two – and with it, the next step in the company's development. Fueled by high-productivity laser tube cutting, production speed nearly doubled and parts could be cut with greater precision. Gradually, the business evolved from a traditional metal fabrication shop into a modern contract manufacturer. And, just like in those early days, this leap forward also came with a catch: many customers didn't even know what laser tube cutting was. "Everyone was familiar with milling and turning, but not laser tube cutting. That's why I often send out sample parts, because they do the talking!" Götzl says.

Using new technology to expand his business model was a gamble – but it paid off. Götzl's shop started helping other laser tube-cutting service providers with large orders and tackling high-mix jobs, from small batches to

Early starter: Peter Götzl founded a company aged just 18. Today, he runs one of Germany's most advanced laser tube-cutting job shops.

IMAGES: Klaus Schwaiger

large production runs, for a wide range of industries, including truck swap bodies, high-bay racking systems, commercial seating and solar racking. Soon, his first TruLaser Tube 7000 was running flat-out over three shifts, and in 2017 he ordered a second one. And it wasn't long before he was as impressed with TRUMPF's service as he was with its machines.

One summer night, around 11 p.m., a laser tube-cutting machine came to a halt – the cutting head was damaged. It took just 30 minutes for Götzl to find the part numbers for the replacement

1

2

A busy day in the high-tech job shop:
1) Some tasks are still carried out by hand, with workers properly protected in welding gear.
2) The STOPA large-scale storage system sends sheet metal on its production-line journey and returns the finished parts to storage – efficiently and fully automatically.
3) Inside the machine, the metal glows; at the monitor, calm expertise is required.
4) Peter Götzl (left) and operations manager Robert Walberer keep a close eye on the entire process.

3

4

Greetings from Chicago: Inspired by TRUMPF's Smart Factory, Peter Götzl built a fully automated sheet metal fab in Erbendorf.

components in TRUMPF's online database and call in an express order. At 5 a.m., a delivery van arrived. By 6, the laser was back in action cutting tubes. "We really value TRUMPF's ethos – from the machines and software to the TRUMPF staff who always have our back," says Götzl.

Chicago in Erbendorf

This level of support was crucial to Götzl's 2017 vision of "Chicago in Erbendorf", which saw him work with TRUMPF to map out an innovative sheet-metal production environment. He bought more land, built a third facility, and expanded his machine line-up to seven laser tube-cutting machines, including a TruLaser Tube 7000 with six kilowatts of laser power and a 12.5-meter loading/unloading capacity – a configuration that has only been installed three times in Germany. "That makes us Germany's biggest laser tube-cutting job shop without a product line of our own," says Götzl proudly. The sheet metal fab is fully automated and built for versatility: TruBend bending machines, TruDisk lasers, a flatbed laser cutting system (24 kW) and a punch laser machine – all connected to the STOPA automated storage system, which feeds raw sheet metal to the machines and pulls finished parts back into inventory. TRUMPF's Oseon software handles material flow and production scheduling, keeping every job visible and making planning easier.

Since 2019, Götzl has put some 25 million euros into the project, including 12 million euros spent on TRUMPF technology. To some, that might seem like overkill. But not to Götzl: "We designed the shop with the next ten years in mind. More laser power means I can cut parts faster and tackle thicker material, which opens up new markets. And customers are increasingly ordering assemblies instead of individual tube components. We're ready for anything!", he says. He still very much believes in staying one step ahead: "We've only implemented the basic version of the Chicago vision – there's still plenty more to come."

Team spirit: Success and quality are a team effort. The slogan on the wall indicates how teamwork helps maintain a steely focus on results.

Customer details

Metallbau GÖTZL
Im Gewerbepark 12, 92681 Erbendorf, Germany
Phone: +49 9682 182045-0
Email: info@metallbau-goetzl.de
www.metallbau-goetzl.de

Machinery

- 2x TruBend 5320
- TruBend 7050
- TruLaser 5030 fiber (24 kW)
- TruLaser Tube 7000 fiber with 12.5 m max. loading length
- 2x TruLaser Tube 7000 fiber
- 2x TruLaser Tube 7000
- 2x TruLaser Tube 5000 fiber
- TruMatic 7000
- STOPA Compact II storage system
- 4x LoadMaster Tube SheetMaster
- ToolMaster
- LiftMaster Compact

IMAGES: Klaus Schwaiger

03

A closer look:

Systematically improving production performance

Many fabrication shops face similar challenges fueled by rising complexity, a shortage of skilled labor and increasing uptime requirements. TRUMPF **combines consulting, data analysis and service** into a holistic approach that examines production from an end-to-end perspective – from planning through to day-to-day operations.

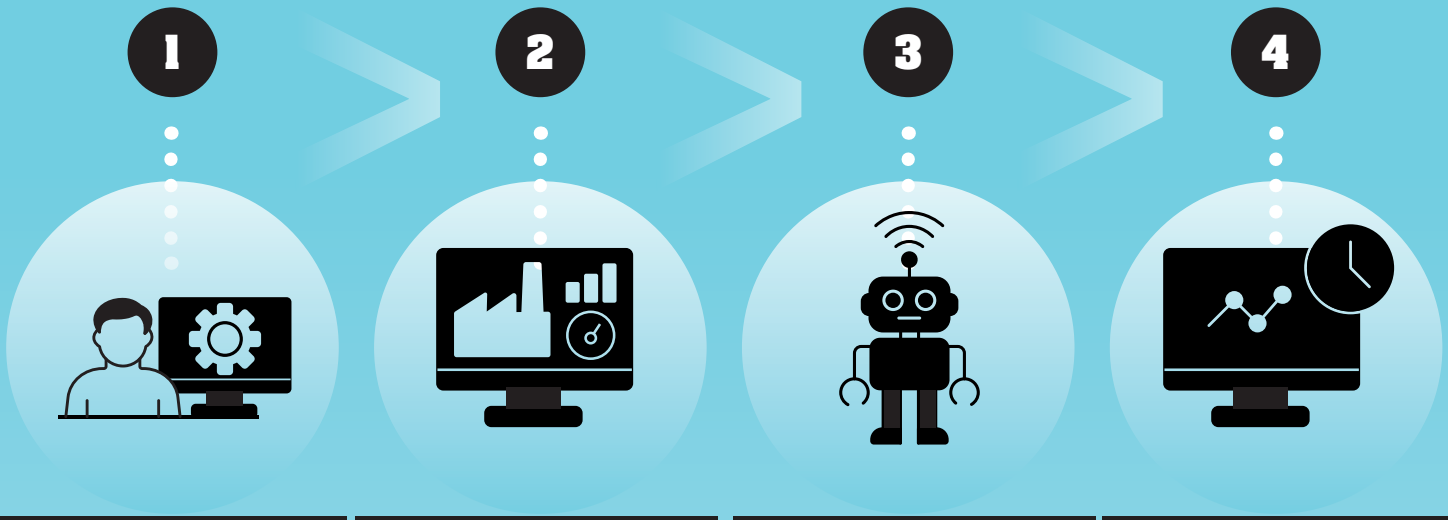
In brief

From plan to performance

Modern fabrication is built around structure, transparency and continuous improvement. With its Smart Factory Solutions and Performance Check services, TRUMPF brings together **planning, implementation** and **data-driven optimization**, helping fabricators stabilize their processes, boost efficiency and deliver measurable customer value.

Smart Factory Solutions: a structured path to connected manufacturing

TRUMPF's solutions for smart factories are not created from cookie-cutter templates. Instead, each project reflects the customer's specific requirements, following a clear, proven workflow that meshes together processes, technology and organizational factors.



1 Analyze & advise

Every project starts with a deep dive into the existing fabrication workflows. A team of TRUMPF specialists analyzes material flows, processes and requirements. Based on the results of this analysis, they develop an overall concept tailored to the customer's manufacturing strategy. The process defines the direction – the technology provides support.

2 Plan & validate in a virtual factory

Real data is used to create a virtual factory. Simulations serve to make layouts, automation levels and software solutions visible at an early stage, enabling fabricators to make clear comparisons. This planning tool assists in the decision-making process by highlighting performance, capacities and potential bottlenecks.

3 Implement & integrate

Experienced project managers oversee the entire project with clearly defined milestones and responsibilities. Working closely with the customer, TRUMPF experts install machines, automation systems and software on the shop floor in a step-by-step process. Each component is integrated into existing systems and workflows to create the TRUMPF Smart Factory. At the same time, operators receive the training they need to run the facility themselves once it goes live.

4 Stabilize & continuously improve

Once production ramps up, automated and software-driven processes ensure high productivity and reliability. A comprehensive range of TRUMPF services – such as Smart View, Remote Operations and Condition Monitoring – guarantee maximum transparency and availability and help ensure any downtime is planned and predictable. All this lays the foundations for continuous optimization – and for the next stage in the evolution of the factory.

Performance Check: targeted unlocking of production potential

How can fabricators improve machine uptime and stabilize their production processes? TRUMPF's Performance Check answers that question by combining data analytics with a personal consultation. Elisabeth Zock, who heads up the global Customer Center network at TRUMPF, explains how customers can identify hidden opportunities and take clearly defined steps to achieve lasting improvements on the shop floor.

Ms. Zock, what exactly is the TRUMPF Performance Check?

The Performance Check is a proactive consulting service that helps customers unlock the full potential of their production operations. It combines digital analyses with a one-on-one consultation. We can offer this service because many machines are already connected to the TRUMPF network via existing connectivity functions, so our experts are able to analyze the machine data, software versions and production KPIs in advance. During the consultation, we show customers exactly how things stand and what concrete measures they could take to improve their operations in both the short and long term.

Elisabeth Zock,
head of the global Customer Center Network at TRUMPF

What are the typical challenges that customers approach you with?

Often, they're facing unplanned downtime, inconsistent quality or unstable processes. Sometimes, they can't keep tabs on key factors such as how much of a machine's capacity is being utilized, whether its software is up-to-date, or how they can push the quality of their parts even higher. Many customers only take action when a machine grinds to a halt, which obviously drives up costs and makes it harder to deliver on time. We can make practical recommendations to address this.

Could you give us a specific example?

We performed an analysis for a major customer in the UK which showed that several machines were standing idle at certain times each day even though they were available. This insight helped them modify their workflows and programs to increase capacity utilization. We also showed the company how it can use TRUMPF's digital services on a daily basis to boost transparency and reap other benefits. Use of the Service app rose from 60 to 90 percent, which led to a significant increase in how fast service cases were resolved.

What are the benefits over the long term?

Transparency around machine availability and utilization, shorter diagnostic times and stable processes. The Performance Check complements our Smart Factory Consulting service by optimizing live production environments in a collaborative, data-driven process. And we offer even more benefits with Condition Monitoring, which allows us to detect deviations early and plan spare parts and service calls proactively. In short, we don't just keep production running – we make it measurably better.

At the company's **headquarters in Ditzingen**, quality isn't seen as a checklist, but as the basis of all the company's activities. During a tour of R&D, production, testing and customer service, **Johannes Böttcher – head of Global Quality for TRUMPF Machine Tools** – explains how this philosophy applies on a day-to-day basis. Early validation is the goal, because it helps prevent downtime, keep deliveries on schedule and give customers around the world confidence in their production planning.

A machined part from a TRUMPF production plant sits on a table in the high-tech manufacturer's development hall. Attached to it is a red tag with the word "Hold". One of the dimensions is off – only by a millimeter, but enough to create problems during machine assembly. "The part didn't pass the quality inspection," says Danijel Novak, a TRUMPF quality inspector. Standing next to him is Thomas Kieferle, who is responsible for production quality in Ditzingen and Hettingen. Nearby, 15 identical parts from the same batch sit on a pallet. Novak has removed them from circulation, too, at least for the time being. Now the discussion begins: can the parts still be used, or do they have to be scrapped? To find out, Novak will run additional tests.

As the head of Quality for Machine Tools at TRUMPF, Böttcher is even more interested in the process behind the defective part than in the part itself. "Our goal is to constantly review our processes so we can intervene as quickly as possible if something isn't running as well as it could," he says. His path through the Ditzingen plant today takes him through all the areas where experts decide on quality long before a machine reaches the customer – from incoming goods and production to testing and service. "For us, quality isn't a final inspection at the end of the process," he says. "It runs through the entire value chain." It's a simple enough principle: the earlier deviations are detected, the lower the cost and effort for TRUMPF – and the lower the risk for the customer's operations.

Close inspection: At the Ditzingen plant, employees measure every component and document every deviation. Even the smallest variation triggers an analysis before a part can continue to final assembly.

IMAGES: Klaus Schwaiger

04

GERMANY

One step ahead in Ditzingen

QUALITY BY DESIGN

Why quality needs to come first

For Marielouise Schäferling, head of Corporate Quality Management at TRUMPF, situations like these are not isolated incidents – they're part of a broader concept. "Quality isn't something you simply check at the end," she says. "It should be built into the system so that deviations show up early and responsibility is clear." The process starts with the incoming goods inspection. A steady stream of parts arrives here from suppliers and international TRUMPF facilities, and experts decide what can be allowed into production. Some batches are inspected in their entirety, others through random sampling. Parts are measured and evaluated, and anything that doesn't pass muster is taken out of the loop. "Everything that leaves this facility has to meet precisely defined quality standards," says Böttcher. "If a part doesn't meet our requirements, it doesn't get shipped." Quality at TRUMPF isn't reactive – it's preventive. The high-tech company qualifies suppliers at an early stage, aligning processes and defining standards. "We constantly keep communication flowing – both before and after the event," Böttcher says. The goal is to minimize scrap and rework while ensuring on-time delivery. Customers benefit from fewer unplanned delays and top-notch quality throughout the entire supply chain.

Machines hum busily as we stroll around the shop floor, and parts make their way from one machine to the next. Quality work at TRUMPF is organized in product groups and carried out by dedicated teams of four drawn from the fields of quality, engineering, production and service. At the heart of the process is the quality assurance lead, who brings the various strands together in day-to-day production. Novak and Kieferle's case is a routine incident that didn't require escalation, but there are still lessons to be learned. "The QA process was successful in this case," Kieferle says later on, "but it could have worked better." The error was noticed – but too late. "We want workers to be spotting defects immediately," says Kieferle. Every defective part that is identified too late not only means more work, but could also directly impact throughput times and customer delivery schedules. Making quality assurance into a systematic, structured process – and not just something that happens on the side – is a question of leadership, says Schäferling: "Standards only help if someone takes responsibility for them," she says.

Direct communication: On the shop floor, Johannes Böttcher (left) discusses the quality of a part with quality inspector Danijel Novak. Decisions are made at the heart of production where they have the most impact.

Quality culture: Marielouise Schäferling embeds quality right across the company. Standards apply not only in production, but throughout the entire value chain.

Using software to prevent downtime

We've reached the testing area, a quieter part of the shop floor dominated not by machines, but by screens, software and simulations. Stefan Sailer works here in his role as R&D manager for testing and second-level support in Technical Customer Service. "We try to digitally replicate machine behavior," he explains. The goal is to test software before it can seize up a real machine. "We can simulate far more scenarios than we could on the shop floor – without the risk of causing downtime," he says. Material flows are

IMAGES: Klaus Schwaiger

Working in sync: Johannes Böttcher and Marielouise Schäferling bring together site-level and global quality requirements. They align standards, set priorities and make sure stipulations are applied consistently worldwide.

> **“ Preventing errors** before damage occurs puts us **one step ahead. ”**
>
> Marielouise Schäferling,
> Head of Corporate Quality Management, TRUMPF

Quality assurance: Thomas Kieferle – quality lead for TRUMPF production in Ditzingen and Hettingen – reviews processes, steps in when deviations occur and ensures standards are applied consistently in day-to-day operations.

still missing from the model, as well as certain effects that can only be tested in a physical environment. But the overall direction is clear: eliminating risks before they become expensive. Schäferling sees this as a useful lever: “If we can prevent errors before damage occurs, that puts us one step ahead,” she says. “The quicker we learn, the less both we and the customer have to lose.” Conventionally, getting a part right involves an iterative loop of preparing cutting data, loading the machine program, laser cutting, evaluating the result – and starting all over again. This

Simulation: In the testing department, Stefan Sailer starts by testing software versions on the digital model. This enables him to validate functions and pinpoint risks before real machines in the field are affected.

time-consuming process wastes material, eats up production time, and ties up scarce skilled personnel. That's exactly why TRUMPF experts developed the Cutting Assistant.

Customer service as an early warning system

Technical Customer Service closes TRUMPF's quality loop by capturing direct, unfiltered customer feedback. Whether a machine halts completely or a minor issue crops up, quality problems are immediately thrust into the spotlight. In Germany alone, the team handles roughly 14,000 annual cases – about 300 weekly – spanning everything from full-scale breakdowns to inquiries about a €2.30 spare part. Over 80 percent of these incidents are resolved remotely or by phone. Customers also benefit from the highly successful Technical Guides, which provide clear, proven solutions for typical error codes. TRUMPF's approach to customer service sets the standard in the industry. "We're definitely not just a call center!" says Bernard Kohl. "We're a team of real experts." He and his colleagues Alexander Mai, Tobias Böschek and Michael Dubberke talk to customers on a daily basis, analyze log data and fault patterns, and coordinate service calls.

"Depending on what the problem is, we'll make sure to send out a service engineer who already has experience with that issue. That way we can be sure of getting the machine up and running quickly so the customer can finish the jobs they're working on. We're great at dealing with urgent situations," says Böschek. This makes Technical Customer Service a kind of early warning system for TRUMPF, and the lessons learned here ultimately feed back into development, the test lab and quality planning. This is what keeps TRUMPF one step ahead: the ability not only to solve

> " We're not a call center. We're a team of **real experts.** "
>
> Bernard Kohl, Technical Customer Support, TRUMPF

IMAGES: Klaus Schwaiger

Teamwork: Technical Customer Service and quality leads keep communication flowing, and feedback from the field is carefully compiled and channeled back into development and planning.

problems but to systematically prevent them. For customers, the payoff is clear: disruptions aren't just resolved faster – ideally, they are never even noticed.

Schäferling argues that quality is far more than just a set of rules. It's the basis on which all TRUMPF's systems are built – from the simplest machine to the most high-end offering. "Quality isn't something you add on afterwards," she says. "It's what holds the whole thing together." That's why TRUMPF's global quality management team sets standards and keeps refining them – not in some abstract sense, but closely aligned to the business units, the market and the customer. "Quality thrives on feedback," says Schäferling. "And on leadership." By keeping the focus squarely on quality, TRUMPF stays one step ahead, gaining a clear competitive edge in terms of successful, satisfied customers.

Direct line: Technical Customer Service handles some 14,000 cases a year. The team analyzes log data and identifies the right replacement parts; many issues can be resolved remotely without sending out a technician.

BIZ+

SHORT CUTS

Innovations, technologies and future trends.

TRUMPF honors early-career researchers

The end of 2025 saw five outstanding early-career researchers receive the prestigious **Werner von Siemens Fellowship** on the TRUMPF campus in Ditzingen. The award – presented by the Werner von Siemens Ring Foundation – recognizes innovative contributions to science and technology in Germany and carries a 10,000-euro prize for each recipient. This edition's Fellows have been setting new standards in **AI data privacy, quantum sensing, materials design, high-precision time measurement and energy-efficient AI hardware.** By supporting the program, TRUMPF is making a targeted investment in scientific excellence and helping to promote the rapid transfer of knowledge into real-world industrial applications, further boosting Germany's status as an innovation hub.

TRUMPF modernizes its Haguenau plant

TRUMPF is investing heavily in the modernization of its manufacturing plant in Haguenau, France, boosting **capacity, quality and competitiveness.** The expansion coincides with the site's 40th anniversary and represents its largest upgrade since 2012. According to Till Küppers, managing director of production, the project is designed to strengthen the plant's long-term viability through more-efficient processes and modern infrastructure. Plans include additional production space, a fully upgraded paint shop, and streamlined logistics flows. Sustainability is also a key concern: new **photovoltaic systems and heat-recovery technology** will significantly reduce CO_2 emissions. Tomas Wolf, head of the Haguenau site, says the project will secure jobs while demonstrating a commitment to sustainable manufacturing. Once complete, production space will grow by 6,100 square meters to a total of 27,800. The plant, which employs more than 110 people, produces machine frames that are later assembled into machine tools at TRUMPF sites in Ditzingen, Hettingen and Grüsch. Construction began in February 2026 and will roll out in phases, from infrastructure upgrades to construction of a new production hall. The investment strengthens the site for the long haul while creating additional production headroom for future generations of machine tools.

TRUMPF presents supplier awards

In January 2026, TRUMPF presented three partner companies with its Supplier Award for outstanding quality, transparency and innovation in a collaborative partnership. **LED-2WORK GmbH**, a long-standing supplier of customized industrial lighting solutions, was recognized for its exceptional on-time delivery performance. Pictured are CFO Feryal Schiga and CEO Jan Schiga alongside TRUMPF managing director of Production Till Küppers and head of Corporate Purchasing Jan Kistner. **Deufol Hamburg GmbH** was praised as a reliable logistics and packaging partner with clear, well-defined processes and sustained cost optimization. **IDS Imaging Development Systems GmbH** was recognized for setting new benchmarks for remote operation and digitalized processes using innovative camera systems. Through this award, TRUMPF seeks to strengthen trusted partnerships and foster joint progress.

IMAGES: TRUMPF

Tech center for plasma generators opens in Taiwan

Toward the end of 2025, TRUMPF opened a **new technical center for plasma generators** in Taoyuan, Taiwan, expanding its local presence in Asia's rapidly growing semiconductor sector. The facility enables faster repairs and a longer service life for production equipment – key factors in promoting **sustainable and resource-efficient chip manufacturing.** Equipped with advanced analysis and maintenance technologies, the center helps customers benefit from the highest levels of precision and efficiency. With this investment, TRUMPF is delivering critical technologies for next-generation microchips while cementing its role as a trusted partner for chipmakers in Taiwan and across Asia.

New TRUMPF Electronics office opens in Beijing industrial center

At the end of January 2026, TRUMPF Electronics officially inaugurated a new location in Beijing, strengthening its presence in the Chinese market. The move, which reflects the continued growth of the **semiconductor industry** in China, brings the company closer to customers to better address their needs. The new facility spans roughly 300 square meters and includes modern workspaces, meeting areas and a **fully equipped technical laboratory.** With on-site testing capabilities, software updates and technical support, the local team can now provide comprehensive support and respond more quickly and efficiently to customer needs.

TRUMPF Education Center wins Honor Award

Late last year, the TRUMPF Education Center (TEC) at the company's headquarters in Ditzingen received the **Honor Award** at the Canadian **Wood Design & Building Awards 2025.** The jury praised the building's **quality and design** as well as its use of wood as a versatile, sustainable construction material. Several buildings on the TRUMPF campus in Ditzingen have already received awards, including the gatehouse and employee restaurant. Designed by **architecture firm Barkow Leibinger,** the buildings support the company's sustainability strategy. "We believe in creating durable structures that combine design and function while giving employees space to explore new ideas – whether today or in 50 or more years from now," says Jürgen Schäfer, head of Corporate Real Estate and Sustainability at TRUMPF.

TRUMPF at Semicon Korea

TRUMPF technologies for **EUV lithography and electronics** are seen as a key component of the semiconductor industry. They enable fabrication of the high-performance microchips that are increasingly in demand due to the boom in AI and big-data applications, especially in **data centers.** To showcase its pioneering manufacturing technologies for semiconductor fabs, TRUMPF recently exhibited at Semicon Korea. One of the highlights was a **new laser dicing process** that separates wafers into die at record speed. The process runs more than three times faster than conventional saw-dicing techniques while producing exceptionally clean-cut edges. For chip manufacturers, the benefits include less post-processing, higher yields and lower operating costs.

Programming Tube: the perfect tube is just a few clicks away

Programming Tube helps fabricators move from a customer inquiry to finished NC code in a matter of seconds by automating design, programming and production preparation for laser tube cutting. The software combines CAD, CAM and automation functions in a seamless workflow – from importing the 3D model to generating the finished program for the machine. Even operators without programming expertise can produce parts on the laser tube-cutting machine reliably and consistently, leading to higher productivity and fewer errors.

Import. Start. Done!

The process starts with a 3D model of the part. Users simply drag and drop a STEP file into the program or import it via the input screen. The AutoRun module acts as the control center: it automatically recognizes assemblies and individual parts and generates all the manufacturing data in the background using smart algorithms. The NC code and setup sheet are ready within seconds. The automated workflow covers the vast majority of individual tube parts and assemblies, so operators always know where things stand.

Expert features when you need them

For complex or critical geometries, the software flags any potential problems. The operator can then call up powerful, user-friendly technology modules to manually adjust the programming or design as needed.

Designed with production in mind

The Tube Design module is built on the industry-leading SolidWorks CAD platform, making it a good choice for both in-house production and contract manufacturing. TRUMPF has integrated a range of functions specifically catering to tube design – including angled frame designs, hook-and-pin connections and positioning aids – so individual parts become ready-to-assemble components.

CAM technology with built-in manufacturing know-how

Acting as the CAM module, Programming Tube handles automatic NC programming. Integrated AI and TRUMPF's manufacturing expertise optimize the cutting strategy, machining sequence and technology parameters. The software simulates parts in real time and identifies critical situations early, resulting in stable processes and repeatable quality.

Real-time visibility and scalability

The setup sheet displays all the manufacturing data at a glance – including cycle times, consumption values and order status. Changes to quantities or parts are updated immediately by the system. Even complex assemblies remain fully under control.

Ready for connected tube production

Programming Tube transfers the finished NC programs directly to the machine. New functions extend automation further, with automated part import and multi-machine programming, plus an API for customer-specific applications. This makes Programming Tube a solid basis for fully automated tube production.

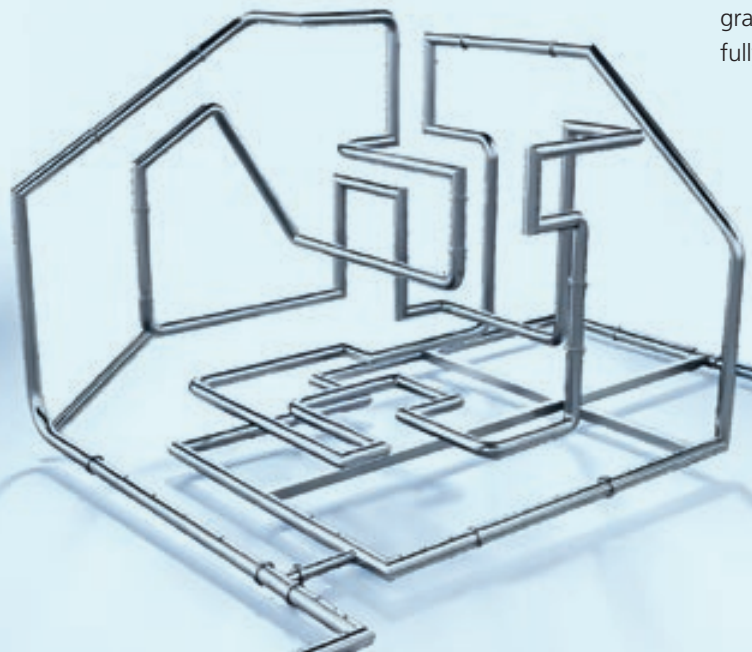


IMAGE: TRUMPF

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 showcases a different application to illustrate how this process works.

This issue:
Designing for punching – boosting production efficiency by optimizing part design

Designers often underestimate how much designing parts for punching can affect manufacturing costs. Yet significant savings can be achieved by optimizing parts for punching from the outset. "The advantages of punching really kick in when you have design and manufacturing working hand in hand," says Markus Schaller, consultant at TRUMPF Part Design. A small electronics enclosure made from thin-gauge galvanized sheet metal illustrates this potential perfectly. With standardized hole sizes, clean edges and short bends, this part is a natural fit for the punching process on a TruPunch machine. The process begins with a well-thought-out part geometry and the right choice of slitting tools. From there, small tabs are cut free with a single slitting tool, allowing a MultiBend tool to form multiple bends on the punching machine. "We don't change the function of the part – we adapt it to suit the manufacturing process. The result is a punch-optimized part that can be produced economically in high volumes," Schaller says. The optimized design also eliminates additional process steps, such as riveting two sheet metal pieces together. Designers align bend lines collinearly – that is, along a single straight line – and use bending as a joining method. "With smart forming operations, we can join sheet metal parts directly, saving on material and reducing the number of process steps. Additional rivets and time-consuming post-processing steps are virtually eliminated – especially for functional enclosures," Schaller says. "Non-optimized parts require a series of individual processes such as laser cutting, bending and tapping. Parts optimized for punching, by contrast, can be processed efficiently on a single machine. That saves time and makes overall costs considerably lower," he adds.

Markus Schaller, Consultant, TRUMPF Part Design

The part in this example clearly illustrates the impact on manufacturing costs: the TRUMPF experts cut total production costs by around nine percent through punch-compatible design. The economic benefits become even clearer at higher volumes. For single-part production, laser cutting can still be up to 40 percent cheaper – but that equation flips as quantities grow. For simple blanks, punching quickly becomes up to 40 percent more economical, even at relatively modest volumes. In TRUMPF workshops, designers learn to design parts that exploit the full potential of the punching process. Shorter throughput times, fewer tool changes, high quality and lower costs are the result. Even a handful of targeted design tweaks can reduce material consumption and cut the number of process steps – ensuring cost-effective manufacturing right from the outset.

BEFORE

AFTER

IMAGE: TRUMPF

Check it out!

DATA CENTER BOOM: WHERE BITS AND BYTES MEET SHEET METAL

Data centers around the globe already handle around 150 zettabytes of data, roughly equivalent to the storage capacity of at least 150 billion one-terabyte laptops. By 2033, experts expect this volume to quadruple, driven largely by the rapid growth of AI applications. The challenge is not just the sheer scale of the data itself, but the enormous computing power and system capacity required to process it. That makes data centers an important growth market for metal fabricators. Modern data center infrastructure depends on sheet metal components in a vast range of shapes, sizes and functions. TRUMPF supplies the manufacturing technology needed to produce them, with flexible, productive, and high-precision solutions for bending, punching, laser cutting and laser welding.

11%

Growth of 11% a year

The data center market is expected to grow by 11 percent annually through 2030. Within just four years, yearly revenue is projected to reach around **620 billion** US dollars. During that period, major players such as Amazon Web Services, Google, Microsoft and Meta are expected to invest more than 320 billion US dollars in new data centers.

100,000 servers – and counting

Tech giants such as Amazon Web Services, Google, and Microsoft run their services out of vast facilities, some with well over 100,000 servers under one roof. Building data centers on that scale calls for well-equipped **infrastructure providers.** Sheet metal components are used in thousands of racks, miles of cable runs, and heavy-duty cooling and ventilation equipment – all of it built to exceptionally high quality standards.

Precise, stable, scalable

Large data centers contain thousands of server racks. That's why the dimensions and geometry of these racks have to meet strict industry standards. Each rack consists of a wide range of components, from standardized mounting elements and sophisticated cable routing to parts designed for efficient cooling. This combination requires maximum precision in design and manufacturing.

Global boom, orbital ambitions

There are currently around **12,000** data centers in operation worldwide. About 5,400 are located in the United States, but investment momentum is strong across all major industrial regions. China has roughly 450 facilities, while the EU accounts for around 2,200 – and both figures are rising quickly. Some companies are even thinking beyond Earth, with plans for data centers in orbit powered entirely by solar energy.

Keeping cool under pressure

As server performance continues to climb, traditional air cooling is reaching its limits. **Liquid cooling** is emerging as the next big trend, with entire servers immersed in a special non-conductive fluid. The coolant completely surrounds every component and absorbs heat directly at the source. That, in turn, places high demands on the enclosure: it has to be tightly sealed, starting with precision-manufactured sheet metal parts.

TRUMPF SOLUTIONS FOR DATA CENTERS

Indirect interlinked – only from TRUMPF

TRUMPF is one of the few technology providers in sheet metal fabrication to **connect standalone machines indirectly** via an intelligent storage system. Cutting, punching and bending remain independent, while fabricators benefit from the flexibility of individual machines combined with the efficiency of a production line. That makes it an ideal solution for the mix of high variety, high volume and small batch sizes typical of data center manufacturing.

4 in 1: cutting, punching, forming & thread cutting

TRUMPF's punch laser machines pack four processes into a single operation: **punching, laser cutting, forming and tapping.** The TruMatic 5000 and TruMatic 7000 handle large parts such as side panels and doors fully automatically, delivering high precision and a scratch-free finish.

High-volume bending, high-precision results

The **TruBend Center Series 7000** automated panel bending machines combine high throughput with the ACB Laser automatic angle measuring system. This makes them the perfect choice for fabricating precision-formed components for electrical enclosures. Users benefit from high productivity when manufacturing housings, as well as tight-fitting doors, covers, brackets and profiles.

For more complex frames and enclosures, the **TruBend Center 7030** automated panel bender rises to the challenge. It reliably tackles even the most demanding negative and positive bends and offers a box height of up to 220 millimeters.

Built for switchgear: the TruLaser Weld 5000

Data centers need electrical cabinets for power distribution. To produce these enclosures, fabricators must be able to create leak-tight, high-quality weld seams while ensuring minimal distortion. For air-insulated and gas-insulated switchgear, that's a fundamental requirement. The **TruLaser Weld 5000** laser welding machine rises to that challenge every time with repeatable accuracy and full automation.

05

FUTURE

SENSITIVITY ON THE SHOP FLOOR

IMAGE: FREEPIK

While machines are getting faster, more precise, and more autonomous, humans remain the deciding factor on the shop floor. **Neuroadaptive technologies** recognize this by detecting stress, strain and fatigue and adapting machines, user interfaces and assistance systems accordingly in real time. This creates a new type of production system focused on both the workpiece and the person behind it. Early adopters can expect to gain a clear competitive edge.

> “ When machines learn to listen to people. ”

A press brake runs in three-shift operation in a metal fabrication shop, tackling a complex job involving small batch sizes. Every few seconds, programs, warnings and process data flash across the screen. At the same time, an operator is setting up a particularly demanding part, juggling multiple steps while keeping a close eye on the material.

For new employees in particular, the mental load can quickly become overwhelming – and that’s exactly where neuroadaptive systems can help. The basic principle is simple: they measure people’s cognitive responses and the implicit signals they give off, interpret those signals and make decisions accordingly. For instance, if the system detects changes in eye movement, reaction time, heart rate or attention, it can automatically adapt the machine or user interface. The principle is familiar from everyday life, for example when a driver-assistance system responds to signs of fatigue, such as the driver loosening their grip on the wheel. Far from feeling like intrusive monitoring, this is a welcome safety net. For the first time, neuroadaptive technology is bringing that same logic to the shop floor in a systematic way, including in sheet metal fabrication, where precision and time pressure are in constant tension. Although neuroadaptive assistance systems already exist, their use in industry is still largely confined to research, prototypes and some initial specialized applications.

Fully automated systems have proven their worth in sheet metal fabrication when processes stay stable, repeatable and consistent over long production runs. But with small batch sizes, frequent retooling or complex one-off parts, full automation often ceases to be commercially and operationally viable. Neuroadaptive systems take a different approach: they deliver value precisely where human flexibility still matters, stabilizing processes by factoring in each worker’s current physical and mental state.

Predictive maintenance for people

When people hear the term neuroadaptive, they often associate it with thought control or implanted chips. But the idea here is very different, says Dr. Mathias Vukelic, who heads up the Applied Neurocognitive Systems team at the Fraunhofer Institute for Industrial Engineering IAO: “It’s about tapping into implicit signals that emerge in the course of normal, routine work.”

Sensors detect the signals, while algorithms classify them and evaluate the situation in real time. This enables the system to determine whether someone is fully focused on their work, uncertain how to proceed or mentally fatigued. Depending on the employee’s mental state, it can then reduce the density of information, display helpful tips or adjust the level of automation. The machine continues to be primarily operated through the keyboard,

touchscreen or foot pedal, but with an additional channel of information flowing in the background. The advantage is that the machine adjusts to the human operator – not the other way around.

Currently, the most advanced technology in this domain is eye tracking. This essentially means monitoring eye movements to determine, for example, what someone is looking at, how long their gaze remains fixed on one point, and whether information has been overlooked or searched for multiple times. In industrial manufacturing systems such as press brakes, laser cutting machines or testing stations, eye tracking can provide useful feedback on how clear and intuitive user interfaces really are and where people face cognitive challenges in their daily work. This can help reduce the risk of operator error, especially in manual or semi-automated processes.

EYE TRACKING: Precise gaze analysis reveals where attention lingers – and the information that people miss.

So, what does this mean in practice? If an employee barely glances at a prompt or sees a warning message when it's already too late, the system could simplify the interface by only showing the most essential information. Training could also be made more effective, for example by popping up content for whatever the trainee is currently looking at. This makes it quicker to train up new staff and improves the ergonomics of the work itself – two important benefits at a time when skilled workers are in short supply. Today, this data is often used to improve user interfaces. In future, systems might also be able to automatically tailor the information the operator receives during a live job depending on how busy and concentrated they currently are.

How sheet metal fabricators can benefit

Sheet metal fabrication involves various factors that make neuroadaptive approaches particularly helpful, including high-mix production, rising automation paired with complex human-machine interfaces, and an ongoing scarcity of skilled labor. Precision and time pressure are increasingly in conflict. Take the manual bending of parts with complex geometries, for instance: operators must feed each part into the tool setup using exact, predefined motions. A split second of uncertainty or mental fatigue, and the risk of a mistake increases. Fully automated robotic bending cells are an alternative option, but they don't make financial sense for every shop. Neuroadaptive systems bridge the gap by providing targeted support for human operators during the process.

HEART RATE: Neuroadaptive systems react to changes in heart rhythm and flag signs of stress or cognitive overload.

Another classic use case is quality inspection and process monitoring. In sheet metal fabrication, employees often have just moments to decide whether a part is within tolerance, needs rework or belongs in the scrap bin. To make this decision, they don't just look at the raw data – they also rely on experience, context and instinct. It's this combination that makes this part of the job so hard to fully automate.

Neuroadaptive systems can recognize mental strain by spotting the telltale signs – eyes darting between monitors, a fixed gaze on a specific point, hesitant input. When the system detects this increase in cognitive load, it steps in to help, perhaps by highlighting the critical metrics, stripping away visual clutter or popping up a contextual tip. The operator is still the one making the final call, but now they can make it with greater confidence and consistency.

IMAGE: Fraunhofer IAO

DR. MATHIAS VUKELIC leads the Applied Neurocognitive Systems team at Fraunhofer IAO. His research explores how machines can detect cognitive load and adapt production systems to human operators in real time.

RESPONSE TIME: Systems detect extended response times that suggest cognitive fatigue and offer support such as assistance functions.

> “ Why the next step in automation begins with people. ”

The business case for this approach could be summed up as “predictive maintenance for people”, says Vukelic. The results are fewer errors, lower scrap rates, fewer accidents caused by fatigue – and a measurable increase in productivity. Studies, including one carried out by the Karlsruhe Institute of Technology (KIT), point to productivity gains of up to 30 percent when systems respond to cognitive overload by automatically simplifying tasks or stripping away information.

Invisible and indispensable

Over the next few years, this sensor technology will make even more inroads into the gear we use at home and at work. “In future, EEG sensors will be as inconspicuous as a smartwatch is today,” Vukelic predicts. But even in the shorter term, we can expect to see smart glasses, headsets or gloves tracking an operator’s focus and fatigue on the shop floor. This will also open up new opportunities for human-robot collaboration. How close should a robot get? And who takes the lead on each task? Neuroadaptive technology could control role allocation dynamically, depending on how the operator is coping and based on the human-in-command principle. The operator would always be the one with the final say.

In the long term, we might see adaptive management not just of a single workstation, but of an entire workflow. Production systems could assign the most complex jobs to hours when workers are mentally at their sharpest. Companies that start testing and rolling out these concepts early will secure systemic advantages in efficiency, safety and employee satisfaction.

Still, setting clear boundaries is essential. Even researchers consider things like performance reviews, recruiting or constant surveillance to be hard red lines. Employees will only accept the technology if the benefits are tangible and they retain control. “The data must belong to the people generating it,” Vukelic stresses. Dystopian ideas – such as neuroadaptive recruiting based on ‘perfect’ brain profiles – remain completely off-limits.

Neuroadaptive technologies are not going to change the factory floor overnight. We’re more likely to see gradual adoption, first as assistance systems, and eventually as smart companions in increasingly complex production setups. Ultimately, their success won’t be driven by sci-fi visions, but by whether they are robust, transparent and suitable for everyday use. It all comes down to industry’s willingness to stop treating people and machines as separate entities – and start thinking of them as a single system.

TEC+

SHORT CUTS

Innovations, technologies and future trends.

TruMatic 5000: more visibility, less downtime

At INTECH, TRUMPF will be kitting out its market-proven **TruMatic 5000 punch laser machine with Vision Equipment**, a feature that uses cameras to provide a continuous view inside the work area. Operators can see on a monitor what the machine is doing at any time – even across different sites. This allows fabricators to **monitor several machines at once, shorten response times and avoid unplanned downtime.** In future, TRUMPF also plans to use the cameras to offer its Remote Operation Support service for the TruMatic 5000. Already available in the US for the fully automated TruLaser Center 7030, this service enables TRUMPF to troubleshoot stoppages remotely. The goal is to help users keep production up and running even more reliably through the night.

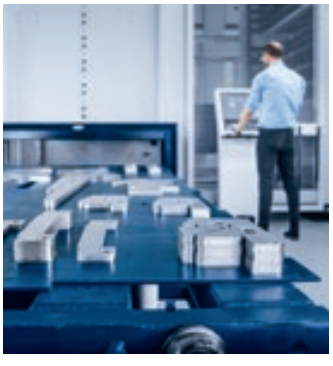
New generation of bending machines available in further variants

This year's INTECH will also see the launch of **two new variants of TRUMPF's economical TruBend 3000** series of bending machines. In addition to the existing model with 130 tons of press force, the series is now also available in 100- and 170-ton versions. The 100- and 130-ton machines offer a bending length of 3 meters, while the 170-ton version extends to 4 meters. "With these new machine variants, our customers can implement their individual production requirements even more flexibly," says TRUMPF product manager Wolfgang Weingartsberger. TRUMPF has also made the 100-ton TruBend 3000 especially attractive from a pricing standpoint. "This machine is a particularly good choice for companies with tighter investment budgets," says Weingartsberger. TRUMPF first presented the TruBend 3000 at Blechexpo 2025. The solution operates with exceptional speed and precision, is **straightforward to program and delivers significant energy savings** – all made possible by a range of technologies that TRUMPF has already successfully established in the market through its premium-segment TruBend 5000 machine series. The impact is clear: TRUMPF has achieved a reduction in throughput time of around 40 percent compared to the predecessor model. The TruBend 3000 is designed as a high-tech, all-round workhorse, capable of handling around 85 percent of parts in sheet metal fabrication. Its high productivity and part accuracy are among the best in this price segment.

Bundle bending jobs, cut setup time

Bottlenecks in production can often be traced back to bending, because every tool change takes time and disrupts material flow. The cumulative effects of this setup work add up fast and can slow down entire production lines, especially when manual bending machines are involved. TRUMPF's new Tool Setup Optimizer seeks to address this challenge directly on the shop floor. In just one click, the software analyzes the tool setups for all released jobs and automatically groups them into batches that can be processed with the same optimized tooling. Benefits include less setup work, faster workflows and measurably higher output in sheet metal fabrication. Beginning at INTECH, users will be able to access **Tool Setup Optimizer** through Oseon, TRUMPF's software for production planning and control.

IMAGES: TRUMPF



200th TruLaser Center 7030 sold

In 2016, TRUMPF introduced its first fully automated laser system, the TruLaser Center 7030. This solution **performs every step of the laser cutting process automatically,** from loading and cutting to part sorting. The market initially greeted the high level of automation with caution, but the machine has now achieved a major milestone. The **sale of the 200th TruLaser Center 7030** shows that sheet metal fabricators increasingly appreciate the value of connected processes. The system offers clear advantages, particularly for shops looking to respond flexibly to incoming orders, boost productivity and offset skilled labor shortages.

Simplifying punching machine setup

Setting up punching machines can be a complex, time-consuming business. Operators must enter tool data manually into the machine's control panel and determine which individual components they need to assemble the required tool. In some shops, that means painstakingly searching through tens of thousands of stored components to find the right parts. If the punching tool is assembled incorrectly, it can damage both the machine and the tool, or render the part unusable, resulting in lost time and lower productivity. The **Equipment Manager Punch** provides the perfect solution. It takes care of **data transfer and tool allocation** automatically, while the software shows operators exactly which parts are required and how to assemble them. Thanks to integrated inventory management, stock levels are always current, cutting search times down to an absolute minimum. Data transfer for TruMatic and TruPunch series machines is included in the new starter package, and customers can easily upgrade to include other features, such as guided tool assembly and inventory monitoring.

AI makes TruBend 5000 even more accurate

With the new **ACB Smart AI** function, the high-productivity **TruBend 5000** delivers even greater precision without sacrificing speed. The new feature builds on TRUMPF's proven ACB Smart angle measuring technology. A laser and optical sensors measure and control the target part angle, while the Touchpoint Bend machine control provides the corresponding bending technology data. ACB Smart AI adds statistical analysis of the first few bends. This allows the system to compensate more precisely for batch-to-batch material variation and, if required, to update the technology database at the same time. This **increases the accuracy** of the ACB bending method when material properties vary and **enhances process reliability** in certain applications, such as those that use bending aids or automated bending.

End-to-end metal fabrication from a single source:

How TRUMPF and STOPA are improving smart factories

By acquiring a majority stake in STOPA, TRUMPF has deepened a long-standing partnership – and customers can now expect seamless solutions for automated sheet metal fabrication with fewer inefficiencies along the way. Jörg-André Junker, head of Product Management, Automation and Storage Technology at TRUMPF, and Edgar Mörtl, managing director of STOPA, explain what role storage plays on the shop floor and what concrete benefits customers can expect.

Jörg-André Junker leads the strategic development of TRUMPF's smart factory solutions. In this interview, he explains why integrated systems – combining machines, storage and software – are becoming increasingly critical for customers, how the majority stake in STOPA is accelerating TRUMPF's pace of innovation, and why end-to-end automation is the key to productivity, transparency and staying competitive over the long haul.

The collaboration between TRUMPF and STOPA stretches back almost four decades. It stems from a shared goal of intelligently linking material flow and machine performance. Today, both companies develop integrated smart factory solutions for sheet metal fabricators. TRUMPF's acquisition of a majority stake in STOPA has given this partnership a new edge.

TRUMPF has significantly increased its stake in STOPA. What are the key benefits customers can expect from this expanded partnership?

J.-A. Junker: The customer gets an integrated system where the machinery, storage system and software work together seamlessly. That promotes stable workflows and predictable throughput times. And customers really notice the increase in productivity.

Why was now the right time to take this step?

J.-A. Junker: There's been a noticeable shift in what our customers need. They're not looking for individual products any more, but end-to-end solutions that encompass the machine, the storage system and the software. Acquiring a majority stake in STOPA gives us the framework we need to take those kinds of solutions to the next level.

What will be the biggest changes to your current partnership?

J.-A. Junker: We can move things forward faster and make joint decisions, and we'll also be meshing development, product strategy and service even closer together. That makes us stronger. Edgar Mörtl and I are already seeing many positive effects.

STOPA has been collaborating closely with TRUMPF for decades. What does this acquisition of a majority stake mean from your perspective?

E. Mörtl: We see it as a logical next step. We've watched the technical and cultural ties between our companies growing over many years. Now we can make our expertise in storage systems an even more targeted part of TRUMPF's overall strategy – with a clear focus on customer benefits.

Where do customers still experience inefficiencies? And how can they be reduced?

E. Mörtl: It's often at the interfaces: different contacts for different systems, manual coordination, data handoffs from one format to another. That's what we're focusing on now. Our goal is to create a smart factory where material automatically gets to the right place at the right time – controlled by software, not by shouted instructions. And, of course, it doesn't stop there. The entire customer experience, including service, benefits from deeper integration.

What role does the combination of STOPA storage systems and TRUMPF software such as Oseon play in all of this?

E. Mörtl: A central one. The software takes care of planning, optimization and control. It organizes material returns, prioritizes orders and optimizes travel times – often running autonomously through the night. For the customer, that means greater transparency and fewer manual interventions.

Manufacturing backbone: Automated STOPA storage systems combine material flow, machines and software into a seamless, end-to-end process. They provide material exactly when it's needed, reduce unnecessary travel within the facility, save energy and boost productivity across the entire shop floor.

Edgar Mörtl, managing director of STOPA Anlagenbau GmbH, has decades of experience in automated storage systems. He explains what role intelligent material flows play in stable processes, why storage is the backbone of modern manufacturing and how customers benefit from scalable solutions that grow with their requirements and secure their long-term investment.

Non-productive time is seen as a productivity killer. How do integrated solutions help minimize it?

J.-A. Junker: Non-productive time often comes down to missing material or unplanned downtime. When the storage, machine and software operate as a single unit, you can reduce both those effects significantly. The system thinks ahead and works proactively.

You refer to storage as the backbone of the smart factory. Why?

E. Mörtl: Because the overall efficiency of a system is only as good as its individual components. The storage system ensures that material is available and processes are stable. High availability is critical in this scenario, because otherwise you're not exploiting the machine's full potential.

Many customers grow gradually or modernize existing facilities. How does your joint portfolio support those scenarios?

E. Mörtl: Our systems are scalable. Customers can start small and expand their storage over a number of years. Some storage systems operate for 25 years – machines get replaced several times over in that same period. That's exactly what our solutions

Jörg-André Junker has a clear vision: The future of sheet metal fabrication lies in integrated systems. Close alignment between TRUMPF and STOPA makes it easier for customers to automate their production and run it more efficiently over the long term.

are designed for. On top of that, we offer customers full flexibility in how their material flow is configured – from compact, flexible storage systems to large, highly integrated setups with multiple interfaces and stations.

What distinguishes large-scale storage systems from compact ones?

J.-A. Junker: We're basically talking about two distinct material flow approaches: decentralized compact storage systems that serve one or two machines, and centralized large-scale storage that acts as a logistics hub for many machines. Each has its own strengths and trade-offs, and we work through those with our customers to identify the most cost-effective solution based on their processes and available floor space. Together with STOPA, we can offer optimized solutions for both approaches and configure the material flow to fit any production environment.

On the shop floor, service often makes the difference between efficient production and downtime. What concrete improvements are users seeing from closer integration?

E. Mörtl: The customer has a single point of contact for whatever they need – whether that involves the machine or the storage system. STOPA and TRUMPF's service operations are converging. That significantly speeds up service processes and cuts complexity.

What contribution do automated storage systems make to sustainability?

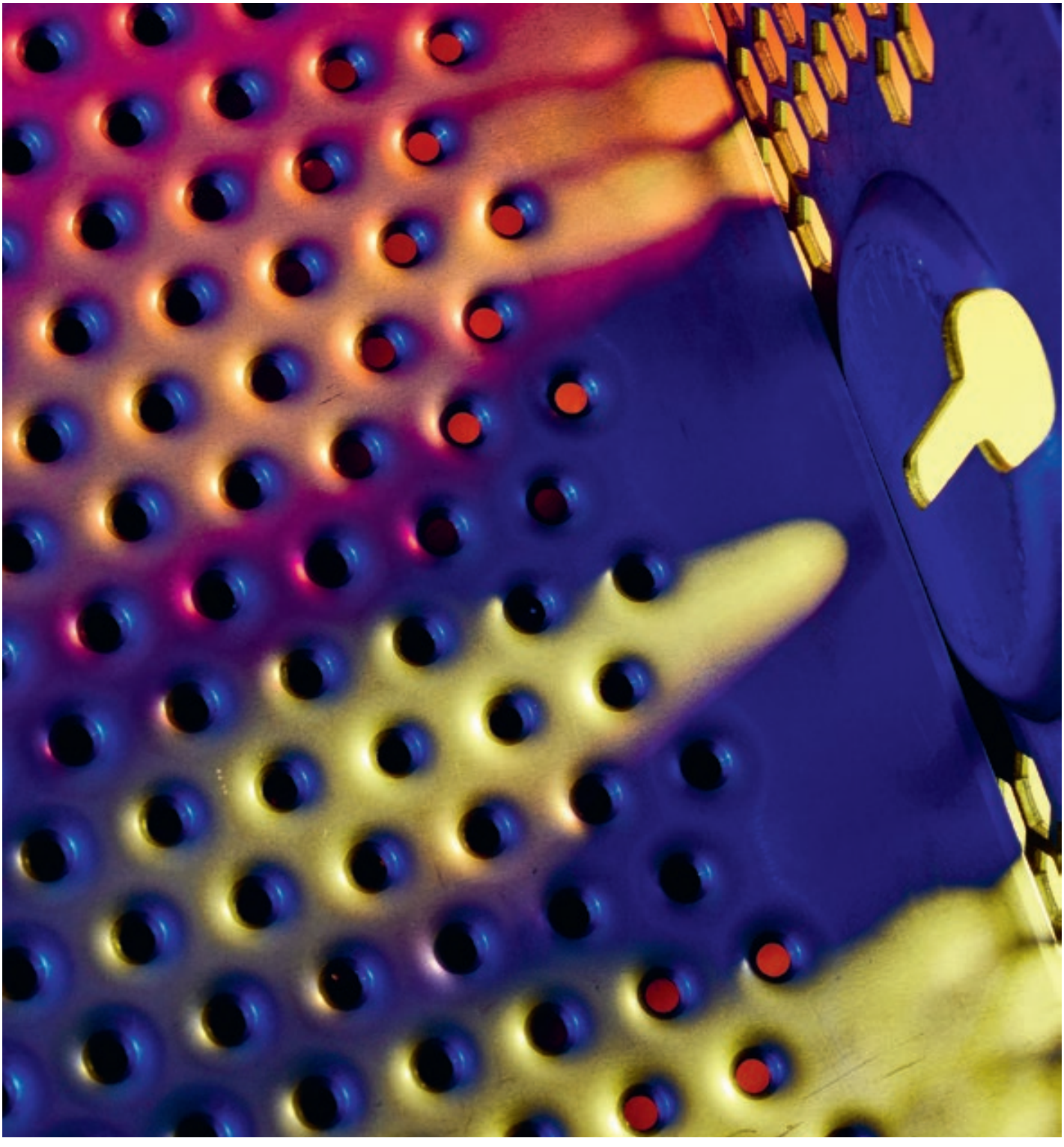
E. Mörtl: In a nutshell: efficient material flows, better use of floor space and optimized processes. For example, material doesn't get carted around the shop floor unnecessarily – it's already available exactly where it's needed. Less transportation means less energy use per part. That adds up, both environmentally and economically.

What can TRUMPF customers expect over the next few years?

J.-A. Junker: We'll be working with STOPA to develop new products that can be flexibly tailored to different manufacturing scales and requirements. Concrete benefits for our customers will include less non-productive time, higher machine utilization, transparent material availability and reduced service effort – all with the goal of boosting their productivity and competitive edge over the long term.

#23

pARTgallery



Presenting selected parts in a new light is something we do in every issue of TRUe.
The picture we've chose for this issue shows **sheet metal parts for an enclosure** like you've never seen them before. As essential **components of electrical cabinets and data centers,** they form the sturdy outer shell for sensitive electronics and represent a fast-growing segment of the sheet metal fabrication market. Manufactured using TRUMPF punching tools, the result combines precision and efficiency within the form itself. The photographers at **Studio Likeness** removed the parts from their industrial environment and reinterpreted them in a completely new way with a stunning lighting installation.

Get ahead by taking it slow

We live in an age in which everything moves at breakneck speed. Parcels arrive the very same day, news flashes across our screens every few seconds, and video calls follow on from each other with little or no breathing room. Even our leisure time sometimes feels like a race as we strive to go faster, stream faster and react faster.

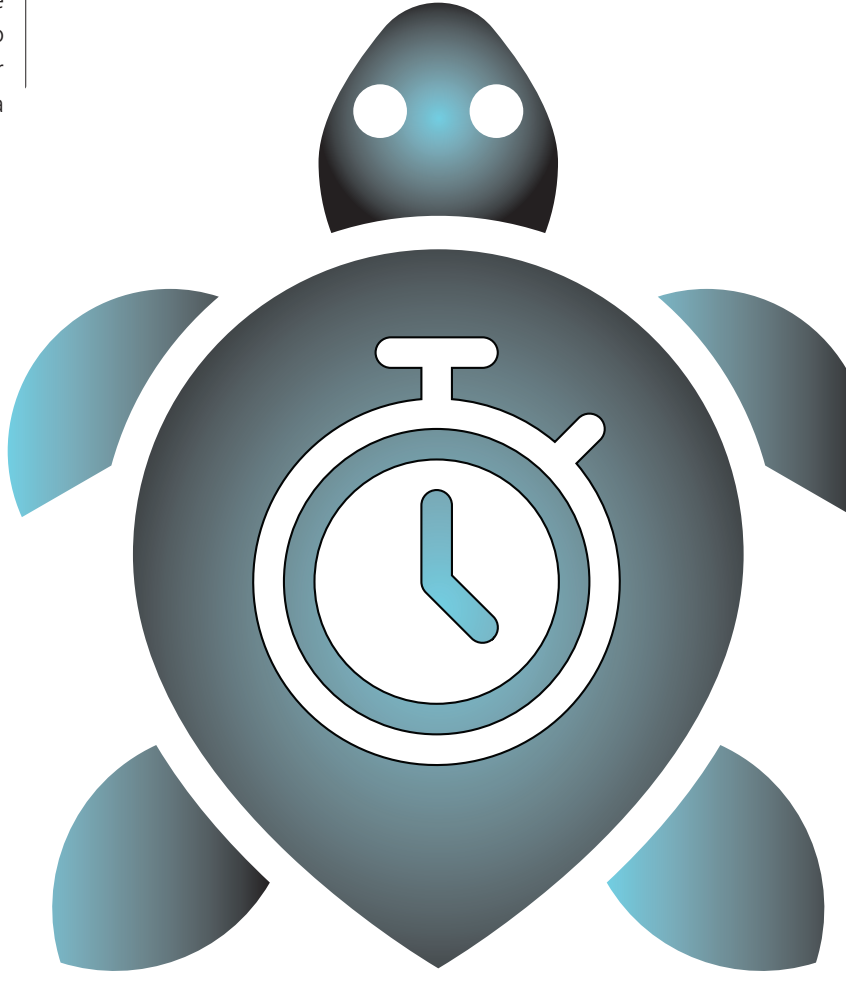
Manufacturing has long been caught up in this state of constant acceleration, with customers clamoring for shorter setup times, quicker delivery times and machines that never stop. Speed is often mistaken for strength – and even the briefest pause can make it seem like you're falling behind. Yet efficient factories rarely operate with the pedal to the metal. Toyota figured this out a long time ago. In their plants, any employee can stop the production line the moment something goes wrong. Not to slow things down, but to make things better. Mistakes are brought to light, not swept under the carpet. And from that moment of calm observation comes a level of quality that has set global standards. It's a success born from keeping speed carefully under control.

In our hectic day-to-day lives, it's all too easy to lose sight of these lessons. A company might rush out to buy a more powerful machine to solve a bottleneck, only to find the expected gains never materialize. Why? Because the real choke point is usually somewhere else: in poor production scheduling, inefficient logistics or a missing spare part that brings the entire line to a standstill. Even the seemingly clever move of buying a low-priced machine can quickly backfire if breakdowns and service issues end up costing more than the original discount.

Productivity remains, of course, a fundamental pillar of any successful manufacturing operation. But it is not automatically the answer to every problem. Sometimes, real improvement only comes when we hit pause, identify the bottlenecks, uncover the root causes and create new structures designed to bring stability to the shop floor.

Warren Buffett captured this perfectly, with his characteristic calm: "The stock market is a device for transferring money from the impatient to the patient". Buffett invests only where he truly understands how value is created – and he takes the time to do it right. His success shows that patience isn't a brake. It's a tool. And sometimes the most efficient path to lasting strength.

Thilo Horvatitsch



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