

TRUe

THE MAGAZINE FOR SHEET METAL EXPERTS



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Ace In the Hole:

Job shop finds creative ways to increase its customer base and workflow

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Boosting Elite Performance:

Manufacturer's systems enhance the training of the world's best athletes

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Celebrating Five Years:

The evolution of TRUMPF's Smart Factory along the Industry 4.0 journey

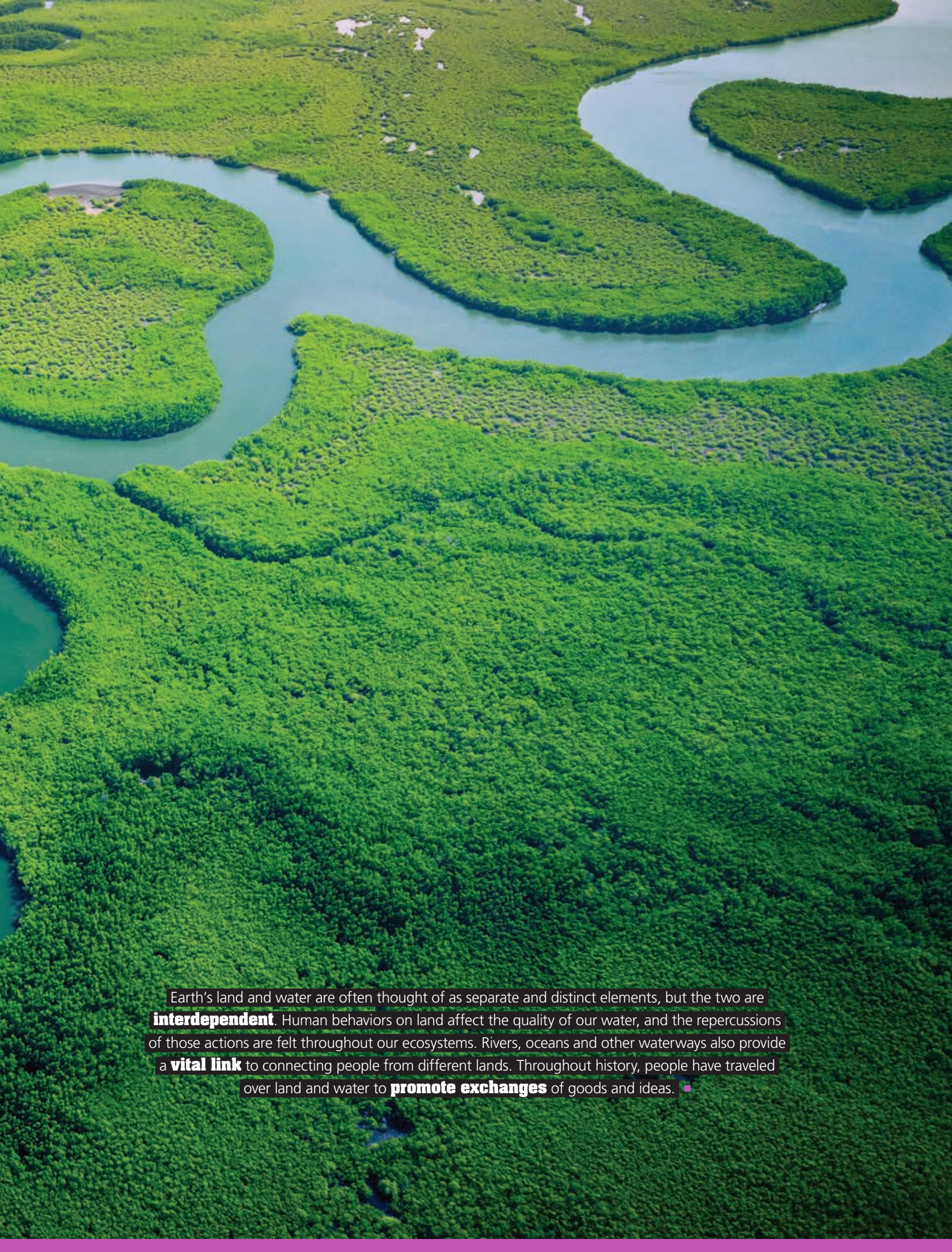
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Getting Connected with #TRUMPF:

Across the continent, customers share snapshots of what TRUMPF machines can make







Earth's land and water are often thought of as separate and distinct elements, but the two are **interdependent**. Human behaviors on land affect the quality of our water, and the repercussions of those actions are felt throughout our ecosystems. Rivers, oceans and other waterways also provide a **vital link** to connecting people from different lands. Throughout history, people have traveled over land and water to **promote exchanges** of goods and ideas. ■



Electricity **powers connections**. When Ben Franklin first experimented with electrical currents using a kite and key, he created a **spark that inspired** the future. Even today, the founding father's contributions to our understanding of electricity continue to have **ripple effects on technology**. Our homes, vehicles, machines, electronic devices, and more are powered by electricity. Today, more than ever, a **dependable network** of electricity is essential to innovation and without it, we would lose our connection to modern society. ■





Gathering around a table to **share a meal** with other people nourishes our bodies and our human need to feel connected. Researchers have found that the act of “breaking bread” or sharing food with others not only has **physical benefits**, but also increases **emotional wellness**. Moving from one person to the next, plates become empty and bellies fill up. No matter the size of the table, there is always room to find **common ground**. As food is passed around and people communicate stories, thoughts, hopes and dreams, **relationships grow deeper.** ■





TruBend 5170

ToolMaster

TruLaser Center 7030

A strong
connection can
facilitate success



In this edition of the TRUe magazine, we take a closer look at the value of making connections. A good connection supports and ensures a smooth flow and transfer. This is true regardless of whether we are talking about a gas line to a machine or a phone line to a customer, materials and parts through production, or information and ideas among people. A poor connection can cause failure and a strong connection can facilitate success.

The current TRUe highlights two customers who demonstrate the importance of connections, and TRUMPF is proud to be linked with both companies. The first story takes us to Las Vegas, Nevada, home of Precision Tube Laser, where Jordan Yost has built a very popular and successful job shop business from scratch, with some help from his social media network and TRUMPF technology. Just outside of Atlanta, in Canton, Georgia, we visit PLAE's 90,000 square foot factory which uses TRUMPF machines to manufacture athletic flooring and equipment. It helps to be well-connected if you want place your product at the big universities and Fortune 100 companies where you will find PLAE's rack systems. But what's more important to CEO Brett Waits are the little details that his company builds into its custom design solutions.

In this issue, we also take a behind-the-scenes look at our showplace of connected manufacturing, the TRUMPF Smart Factory near Chicago. It may seem hard to believe, but it has been five years already since the Smart Factory first opened its doors and we started showing customers what the next generation of manufacturing could look like. In an interview with Smart Factory Director Kartik Iyer, we look back at the Smart Factory's beginnings, discuss the current state of Industry 4.0, and peek at the horizon of digitized and connected manufacturing.

Our Smart Savings column returns to encourage you to investigate innovative approaches to better sheet metal designs. In this issue, Smart Part Consultant Taylor Wright rethinks the design of a roller stand and employs a process that not only saves production time and cost, but also improves the quality of the product by creating stronger connection points.

If you would like more sheet metal tips and ideas, connect with us on social media. Last summer we reached out on Instagram and asked our followers to show us what they could make with our machines. In this issue of TRUe, we show you what customers from across North America – from Florida to California and from Canada to Tennessee – have been busy creating using TRUMPF technology.

This fall, I look forward to connecting with you at one of many upcoming trade shows TRUMPF is attending. It is wonderful to finally see an end to the dark pandemic days that weakened our connections and left some feeling isolated and uninspired. The enthusiastic return to bustling trade shows is proof that the world is eager to network and reconnect with others in the industry!

A handwritten signature in black ink, appearing to read "Lutz Labisch".

LUTZ LABISCH, PRESIDENT & CEO

TRU[®]

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04



01

NEVADA

*Social media grows customer connections
and business in Las Vegas*

ACE IN THE HOLE

Even in Las Vegas, gambling capital of the world, building a tube laser cutting business from scratch – without a history in metal manufacturing – was a risky play, especially in 2018. But over the last four years, the bet has paid off for Jordan Yost, co-owner of Precision Tube Laser. Today, the successful Nevada job shop offers automated tube and flat sheet laser cutting and bending. Yost keeps rolling the dice and pushing the limits to find innovative new ways to produce more parts, demonstrate capabilities, and connect with customers via social media.



PRECISION
TUBE LASER
WWW.PTL.MFG.COM

PRECISION
TUBE LASER

ToolMaster



Building a base

Precision Tube Laser has gained a lot of social media attention, fans -- and jobs -- since it officially opened in 2018. The Las Vegas company's mesmerizing laser cutting videos often attract more than a million viewers. In fact, one recent spiral tube cutting video logged more than 2.9 million views on Instagram. Precision's more than 50,000 followers might be surprised, however, to learn the job shop is not a spinoff of another manufacturing company. Despite owning businesses for 40 and 20 years respectively, father and son co-owners Barry and Jordan Yost hadn't created a metal fabrication business before Precision.

A better way

Trade show booths are big business in Las Vegas. After Jordan Yost sold his last business, he worked for a friend's fabrication company that made parts for trade show booths, and it sparked an idea. "As a businessperson," explains Yost, "I looked at the scale of their operation and the processes they were doing manually, and I thought, there has to be a better way."

Yost and his father were looking for an opportunity to create a business together. "We're very good at finding solutions to people's problems," he says. "We discovered many shops struggled with manufacturing tubing -- all the drilling, milling, sawing and deburring. It's one of the harder processes. For two years, I did extensive analysis of the potential risks and rewards of getting into laser tube cutting and I knew we could be successful with the right equipment and innovative exposure to promote our approach."

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"After our **first**
interaction with
TRUMPF, it was hard
to go anywhere else."
.....

Draw, cut, film, repeat

Yost put together a business plan and went online to request information from TRUMPF. He was soon connected with Regional Sales Manager Larry Johnson, who Yost says has become "a great friend and incredible source of knowledge." He admits, "after our first interaction with TRUMPF, it was hard to go anywhere else. I understand there's other equipment that will do similar things, but when you compare apples to apples, looking at the usability, reliability and consistency, there's really no comparison."

Precision purchased its first TRUMPF machine, a TruLaser Tube 5000 fiber, in 2017, but before it even arrived, Yost began a social media campaign to introduce the technology. Precision's first tube laser cutting video was posted to Instagram six months before the machine was installed. "Once we were up and running, I spent 8 to 10 hours a day with the machine drawing, cutting, filming, and then drawing, cutting, filming again," says Yost. "We didn't have another way to make income. We had to get people to respond to laser tube cutting."



A positive response

It wasn't long before Precision's videos went viral, and business took off. Although the company initially focused on laser tube cutting, Precision's business evolved into a balance of tube and sheet metal work. "Early on we realized that many tubing projects relied on sheet material parts to go with them," Yost explains. "And when you bring in flat sheet cutting, then people will want bent parts too."

So, in 2020, Precision added a TruLaser 1040 flat sheet laser cutting machine with automation and a TruBend 7036 press brake to handle the wide variety of work from large production runs to just a handful of parts. Yost estimates he runs 25 to 30 jobs daily. "It ranges," he says, "but we're usually pushing out about 10,000 individual parts a day."

Job shop of the future

"We aren't your average job shop. I tell people we make money by putting holes in metal, but truly we use the best equipment in the business to manufacture parts and components," Yost says proudly. "When you understand all the technology is truly capable of, the sky's the limit! Whether it's cutting or bending, we find a way to push beyond the limits on a regular basis."

When Precision moved into a new 22,000 square foot facility in September 2021, Yost built a job shop of the future. "We're a just-in-time manufacturing facility. Most materials are ordered on the fly, brought in, processed and sent back out as parts," he explains. "Our environment is everchanging, but we're able to keep quality consistent. I think a facility this clean demonstrates the care with which we treat customer parts."

The new building created room for another tube laser cutting machine, a TruLaser Tube 3000 fiber, to act as a backup for the 5000 and maintain extremely low lead times. Precision also added a press brake with automatic tool changer. "It's almost unheard of for a shop our size to have a TruBend 5170 with ToolMaster," says Yost, "but we bend enough parts in a day to justify it. The other day we bent around 2,000 individual parts with 19 different tool changes. It has opened us to a whole new range of capabilities. No labor-intensive tool changes are needed - that's done in the programming. Our operators can just focus on making the most accurate parts on the planet."



With 2.9 million views on Instagram, Precision's most popular video is of this spiral tube being cut.

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"When you understand all the technology is truly capable of, the sky's the limit!"



Sustainable choices

Currently Precision Tube Laser serves more than 1,000 customers nationwide. “We have a 95 percent customer return ratio and the 5 percent that don’t return are typically enthusiasts with one-off parts,” Yost reports. “A lot of companies only chase the big fish, but we go after sustainable customers, that is the average shop that will need help over and over again.” The flexibility of TRUMPF machines assists Precision in creating “little pockets of time” to fit in smaller jobs profitably. “Right now, we have about 20 full-time employees,” he adds. “I have enough work for about 40 people, but that’s not the way we operate.”

The shopfloor culture is similar to the company’s social media approach: very professional and serious, yet fun. To fill the void Yost feels is created by “lifers in this business working their way out and not leaving their knowledge behind,” he brings on younger workers and gives them the opportunity to develop long-term careers. “If you’ve got a good attitude, willingness to learn, and show up every day, I’ll teach you anything and everything about these machines.”



Social connections

The majority of Precision Tube Laser’s work ships out of state and Yost says he’s met fewer than 5 percent of his customers in person. Most communications take place over the phone or through email or social media. Yost estimates 80 percent of the company’s interactions start with social media. “Especially when they’re reaching out for the first time, people are looking for easy, comfortable ways to communicate,” he explains. “Instagram seems to resonate best with our industry, so that’s what we use. The more transparent you can be, the easier it is for customers to see what their experience will be like when they try your service.”

An authentic approach to social media yields positive results but requires time and effort. “I treat social media like another machine,” Yost explains. “I spend time working on my skills and trying to understand its potential - what it can and can’t do. We’re a small company, but our social media voice is strong. At the end of the day though, you don’t get to choose what’s cool. There have been plenty of times we produced a video and thought, ‘wow, this is going to break the Internet!’ and it does nothing. Then we post a basic part and people go wild over it.”

Defying the odds

Like many fabricators, it’s all about time for Yost. “We’re all battling the same problem,” he says, “everyone wants to get more out of the 24 hours in each day without adding more people to the mix.” Yost’s solution is a TruLaser Center 7030 that arrives in May. “It will increase our ability to get parts out quicker and maintain lead times while tackling larger jobs. The financial decision isn’t easy, but for what we’re getting, the value far exceeds the cost.”

Precision Tube Laser has seen steady growth over its four years in business. Last year, the company grossed about \$2 million in sales. This year, it is on pace to earn just over \$6 million. Yost hopes to continue building his vision of a job shop of the future: utilizing equipment where it’s strong to create high-quality parts in clean environments. “I think what we do is special,” he says. “We work hard to perfect our craft, connect with customers and help them find solutions.”

In Brief

Precision Tube Laser Machine Portfolio



TruLaser Center 7030

The TruLaser Center 7030 is a full-service automated flatbed laser cutting machine that takes care of everything from the drawing to sorted cut part. It is one of the only machines on the market that can flexibly cut a part of any size and shape, sort and stack it completely autonomously.



TruLaser Tube 5000 fiber

The TruLaser Tube 5000 fiber achieves high speeds in laser cutting of tubes and profiles with a diameter of up to 5.98 inches and can process heavy tubes with thick walls. This flexible high-end machine expertly handles a wide range of parts and laser tube cutting applications.



TruLaser 1040 fiber

Known for its low investment and low operating costs, the compact TruLaser 1030 fiber is a highly productive machine that is also simple to operate. Excellent cut quality is ensured by the versatile TruDisk solid-state laser which is capable of processing even highly reflective materials with ease.



TruBend 5170 with ToolMaster

The TruBend Series 5000 press brakes are capable of highly productive and precise bending. The fast, user-friendly and ergonomic press brakes offer innovative programming, tool setup design, and other features for flexible part production. The ToolMaster automatic tool changer stores, manages and sets up tooling for each new program on the bending machine.

The customer

Precision Tube Laser

Jordan Yost, Co-Owner
6180 S Pearl St. Ste F
Las Vegas, NV 89120

Phone: 702-763-8368
www.ptlmfg.com

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



To extend your application spectrum, **TRUMPF offers other suitable product enhancements** for every machine.

02

GEORGIA

Technology adds strength to the pursuit of perfection in Canton.

BOOSTING ELITE PERFORMANCE

In athletic training facilities, flooring was always seen as a commodity product. PLAE Founder and CEO Brett Waits saw this as an opportunity to combine his heritage, experience, and passion for human performance to drive change. His vision expanded from flooring to complete human performance and he ended up influencing strength and conditioning for elite athletes around the globe.



Raising the bar

Almost all synthetic turf in the world is made in Dalton, Georgia, the southern town where Brett Waits was born and raised. Instead of joining his family in the flooring industry, he went to work for one of the largest commercial strength and fitness equipment manufacturers in the world. Here he gained valuable business experience as the company saw unprecedented growth. After a decade at the company, he was ready for a change. "Strength and conditioning as well as human performance had become increasingly popular, and I saw an opportunity in the market to design high-quality sports flooring specifically for coaches and athletes," he recalls.

In 2009, Waits founded PLAE with a passion to change the industry. "We connected with some of the top strength and conditioning coaches in the world and based developments solely on discovery," explains Waits. "We went into their facilities, watched them train athletes, and tried to understand their programming to maximize the efficiency of their space."

Armed with these insights, they began to design premium products. "We put a lot of ingenuity and technology behind our products to best protect the athlete's body, create functionality, and enable coaches to train athletes more effectively," explains Waits. It was a success, and word spread quickly. "It's a small and connected industry, globally. As people started sharing on social media and within their networks, our business grew organically. It ended up as the best marketing strategy."



PLAE prides itself on bringing each customer's visions to life through customization and elite level execution.

Making gains

PLAE completed more than 2,000 projects in 35 countries in 2021 alone. The athletic performance market accounts for 50 percent of its business and includes high school, college and professional athletic training centers, such as the Toronto Blue Jays Player Development Center in Florida, as well as private facilities. The second half of the business focuses on three markets: military/defense training, college student recreation, and corporate wellness. Customers are often Fortune 500 companies looking to recruit top talent with world-class facilities, such as the space PLAE created for Under Armor in the historic Baltimore Trust building in Maryland.

Although Waits vision for flooring laid the foundation for PLAE, aiding human performance was always a primary focus. "From the beginning, we saw ourselves as an experience brand, not a product brand," he asserts. "We take our customer's vision and bring it to life like no other, through customization and elite level execution."

During the concept design phase, PLAE now hosts customers in a state-of-the-art innovation and human performance facility at its company headquarters in Canton, Georgia. Acquired in 2020, the campus exemplifies PLAE's commitment to excellence, spanning nine acres and featuring amenities such as a pedestrian trail and outdoor basketball court.



Ninety percent of PLAE's floor and rack strength training systems are fully customizable.



Full range of motion

Surprisingly, PLAE did not manufacture any of its own products until recently when it invested more than \$12 million in a 90,000 square foot innovation factory for its ICONx modular rack system. "Ninety percent of our floor and rack strength training systems are fully customizable, and we pride ourselves on creating unique solutions through true collaboration with strength coaches. Every piece is built specifically for each customer," Waits explains. The University of Florida provided the first opportunity, and PLAE was all in. "Our brand and credibility were on the line."

Waits connected with experts to guide them. "We had a lot of support to make sure we did things right from the very beginning. TRUMPF did a great job educating us, and we brought in elite consultants made available by the Georgia Manufacturing Extension Partnership through Georgia Tech's Enterprise Innovation Institute to help us with the machinery, fabrication, and layout of our facility," says Waits.

Waits was familiar with the TRUMPF brand and says it was the only machine tool manufacturer PLAE considered. "TRUMPF has a high-quality product in each category of manufacturing, as well as the automation, software, and service to go along with it," he asserts. "We felt confident it would guarantee quality and consistency throughout manufacturing, and give us a controlled and organized process that we could easily manage. It was also appealing to have a single point of contact should any issues arise."

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"We take our **customer's vision** and bring it to life like no other, through **customization and elite level execution.**"
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The next set

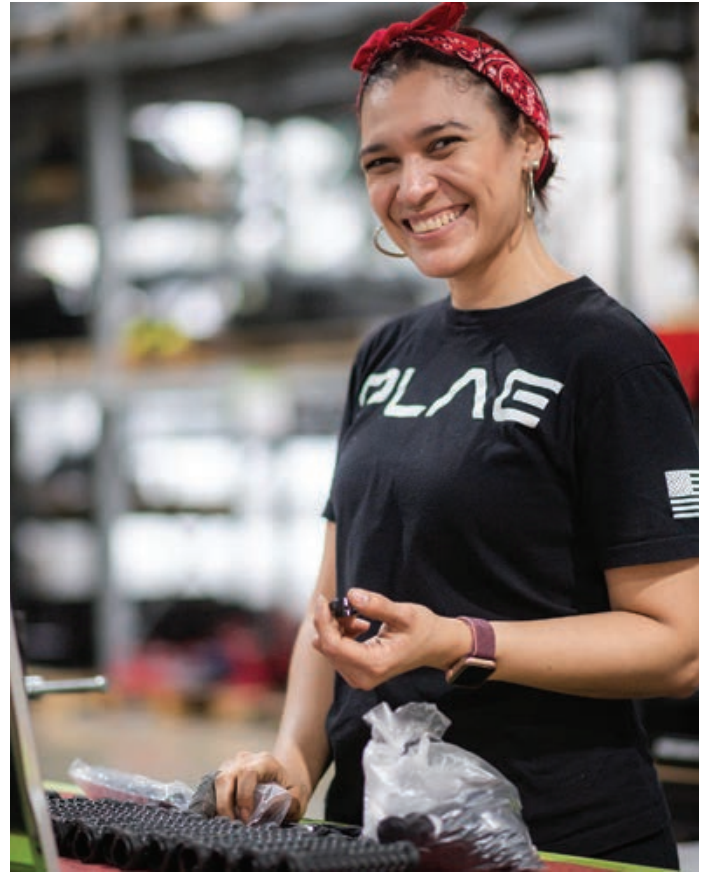
In just a few months, the TruLaser Tube 5000, TruLaser 1030 fiber with LiftMaster Compact and PartMaster, TruBend 7050 and TruArc Weld 1000 were installed in the new factory. The first prototype was produced to perfection. Waits says the biggest challenge since then has been finding ways to maximize the efficiency and throughput of the equipment. "It's like a puzzle. Every day we get a little better, we get another piece in place, and we see our progress. Getting uncomfortable has allowed us to step outside what's been our normal for over a decade and challenge ourselves to think bigger. We know the work we're putting in now will set us up for long-term success," he says.

PLAE uses the TruTops Boost software to program machines more efficiently. "Training facilities all use the same apparatuses – racks, barbells, kettlebells, medicine balls, battle ropes – but how they are used is based on the coach and the output of the athlete," Waits explains. As PLAE connects with customers on these details, it builds out every square inch of space for maximum functionality and unlimited options in programming. Each rack system is customized in fit, function and branding. "We recognize customization slows down manufacturing, but we are passionate about our process and spare no expense to help customers realize their vision for a world-class facility," Waits emphasizes. "Our customers appreciate this approach and are drawn to it."

FORMULA for success

PLAE prides itself on connecting with customers as they collaborate, solve problems, and deliver premium solutions. "FORMULA is what we call our process, and it's far more than just the design build; it's the experience we have with our customers and our differentiator in the marketplace," stresses Waits. It also helps drive innovations and contributes to PLAE's success.

This drive for world-class performance is a characteristic PLAE employees often share with its customers. "The pursuit of perfection is something we embody. It is part of the company's DNA," Waits explains. Ownership is felt throughout the company; in all its 85 employees in the United States and 22 international employees who largely work at PLAE's second headquarters in Australia. "Everyone knows our customers strive for the very best and that their work contributes to it. There's pristine alignment across all areas of the company, and everyone feels empowered knowing that the work they're doing equally contributes to the customer's experience and interaction with the brand." The result is an elite performance brand, always striving to be its best, and always looking to help others do the same.



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"It's like a puzzle. Every day we get a little better, we get another piece in place, and we see our progress."

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In Brief

PLAE Machine Portfolio



TruLaser Tube 5000 fiber

The TruLaser Tube 5000 fiber is an efficient solution for laser cutting a large range of tubes and profiles. It features many integrated technologies such as its intelligent clamping system that requires no setup and RapidCut for higher feed rates and exceptional productivity.



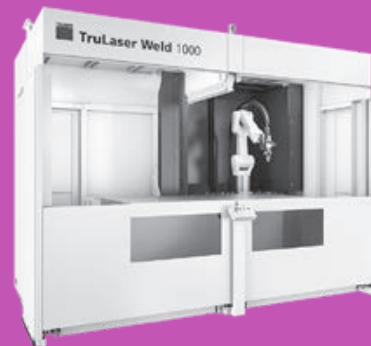
TruLaser 1030 fiber with LiftMaster Compact and PartMaster

The TruLaser 1030 fiber is a versatile and easy to operate laser cutting machine featuring low investment and low operating costs. It is offered with the LiftMaster Compact to increase productivity through the automatic loading and unloading parts and the PartMaster for easier removal of finished parts and skeletons.



TruBend 7050

The highly productive TruBend 7050 electric press brake excels at bending small and medium sized parts with remarkable speed and precision. It features a press force of 55 tons and can bend parts up to 60 inches long.



TruArc Weld 1000

The TruArc Weld 1000 robotic arc welding cell enables fabricators to start laser welding. It is simple to program and operate even with limited welding experience, and a profitable solution even for high mix, low volume production.

The customer

PLAE

Brett Waits, Founder & CEO
190 Etowah Industrial Court
Canton, GA 30114

Phone: 404-645-7900
www.plae.us

- TruLaser Tube 5000 fiber
- TruLaser 1030 fiber with LiftMaster Compact and PartMaster
- TruBend 7050
- TruArc Weld 1000



To extend your application spectrum,
TRUMPF offers other suitable product enhancements for every machine.



03

ILLINOIS

*5 Questions to Celebrate 5 Years, An Interview
with Smart Factory Director Kartik Iyer*

FIVE YEARS OF CONNECTED MANUFACTURING

It seems fitting that the Smart Factory is located just outside the “Windy City” of Chicago, especially when you consider the winds of change it has brought to the fabrication industry. Over the last five years, the lone voices of Smart Factory experts extolling the benefits of digitized and connected manufacturing have grown into a chorus.

Smart Factory Director Kartik Iyer says customers experience the entire connected sheet metal process chain from the initial part order to its design, manufacture, and delivery.



On September 12, 2017, when the Smart Factory opened, the awe-inspiring software, systems, and machinery inside it may have seemed like science fiction, but today they are a fast-growing reality in many shops. We talk about the past, present and future of connected manufacturing with Smart Factory Director Kartik Iyer.

Congratulations on celebrating your fifth anniversary! It is not surprising that TRUMPF, as an innovative industry leader, was the first machine tool manufacturer to build a Smart Factory in Hoffman Estates. What do you think inspired TRUMPF to build the Smart Factory near Chicago and what was it like when it opened?

Kartik Iyer: Even though I wasn't here – I've only been the director of the Smart Factory since 2021 – I think the reason TRUMPF first built the Smart Factory here was to give customers an opportunity to experience the entire digitized and connected sheet metal process chain – from the initial order for a sheet metal component to its design, manufacture, and delivery. And I think TRUMPF chose to build a Smart Factory here in Hoffman Estates because it is so close to Chicago, which is at the center of the North American market for sheet metal processing. About 40 percent of the entire sheet metal processing industry is based in directly neighboring states.

The Smart Factory is a beautiful building and when it opened five years ago, I have to imagine it was just as impressive. People must have marveled at the wood and metal structures, just as they do today. It is hard not to be impressed by this 50,000 square foot building filled with the latest automated production technology!





More than 8,000 external visitors from 1,800 different companies have visited the TRUMPF Smart Factory since it opened five years ago.



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“I think customers have really **started to embrace** the concept of connected **autonomous manufacturing.**”
.....

How has the Smart Factory changed since it opened its doors?

Iyer: It may look a little different, but the Smart Factory’s main goal of developing Industry 4.0 solutions for the sheet metal industry remains the same. The types of problems we are solving, the level of automation we have developed, and the features in the software we offer have come a long way since we opened. The machines are different too. All but one machine in the Smart Factory has gone through an update or been replaced by a new model with additional features for increased automation, throughput, and productivity.

One particularly exciting change has been to the TruLaser Center – the world’s first fully autonomous part sorting laser center was upgraded from a 6kW to 12kW laser and has a new automation strategy to better handle scrap for lights-out production. Our TruBend Center 7030 has evolved to include an automatic loading system and part manipulator that eliminates the need for an operator to manually bend the part. We’ve expanded our welding portfolio into cobot-based arc welding solutions. Recently, we have added solutions to track parts on the shop floor and AGVs, or driverless forklifts, that move material from one operation to the next based on the priority of orders. Today we focus on managing the logistics of orders using those autonomous forklifts, intelligent docking stations, and bar code scanners. We have revamped our MES (Manufacturing Execution System) software to the next generation platform called Oseon, which offers solutions that can grow with the customer. In the last five years, the Smart Factory has really advanced in the Industry 4.0 journey with a focus on automating operations, such as the integration of the cutting and bending processes or ICB systems.

People love to tour TRUMPF’s Smart Factory. How many people have visited the Smart Factory since it opened and what do you think draws them here?

Iyer: Since it opened five years ago, more than 8,000 external visitors from 1,800 different companies have come to Chicago to see the Smart Factory. The number of visitors is impressive, but so is the growing diversity of visitors we have seen. Certainly, we’ve witnessed a wider range of customers looking into Smart Factory solutions. It’s not just large OEMs who want to automate, a lot more job shops who had not looked seriously before at automation are visiting. I think customers have really started to embrace the concept of connected autonomous manufacturing. Living in an age in which so many things are digitally connected has made it easier for people to understand the concept of connectivity. They can appreciate the need for it and are open to adopting these solutions in their factories. Initially customers made visits to understand what we were presenting and to grasp the scope of what a Smart Factory could do for them. As we evolved, our first real projects were completed, and customers could experience and relate to the actual connected Smart Factories. Over the past five years we have seen customers’ lot sizes decrease, paired with a shortage in labor, and this has further amplified the need for flexible and automated fabrication solutions across North America. I think we have been very successful in inspiring customers to visit, explore ideas, and make the leap to digitally connected production that increases their productivity.

Consulting is a large part of what you do at the Smart Factory. Tell me about the customers who seek out the help of Smart Factory consultants and why they turn to TRUMPF. How do we help transform their plans from concept to reality?

Iyer: Yes, Smart Factory consulting is an important part of what we do. We have been handling about 40 projects a year, but with the expansion of our experienced consulting team, we expect that to double. Many people are surprised to learn that it isn't just big companies that seek out Smart Factory consultants. Actually, it is more common for smaller companies to turn to us since they do not have the staff onsite to help them evaluate manufacturing challenges and continuous improvement projects. Smaller companies find it cost effective to use our consultants to conduct value stream mapping, multi moment studies, and production analysis which they would never have had time to do otherwise. But of course, larger OEMs work with us on consulting projects too. Sometimes they just need to get a different perspective from that of their manufacturing engineers who might not be able to see the problem as an outsider. Companies, both big and small, come to us for help in solving problems related to material flow, production capacity, programming bottlenecks, too much work in progress, scheduling challenges, prioritizing issues, and more.

Since many companies tend to face similar challenges, the TRUMPF experts can quickly identify problems and suggest suitable solutions. TRUMPF's Smart Factory consultants assist customers in analyzing their businesses and optimizing processes. Or they can help set up a new production facility and navigate the path to the right connectivity solution. Consultants help guide companies along the roadmap of the steps in the process – create, plan, implement and monitor – to transform smart factory concepts from plan to reality. First, they spend a week at the customer site to understand

the current production shop floor and material flow. Then, they conduct swim lane process analysis with various stakeholders and identify non-value-added operations that can be eliminated or automated. Next, they perform multi-moment studies that record machine utilization, and they analyze customer production data to simulate it across potential machines that can solve customer problems. Of course, they also develop an analysis of the return on investment which gives the customer an understanding of investment payback. What's great about the services is that they can be scaled to meet the needs of the customer. We can start with a very generic analysis of production in the fabrication shop and then deep dive into specific areas that are identified as opportunities for improvement.

Where are we headed? What is next for the Smart Factory?

Iyer: I believe that Smart Factories are driving the future and the fourth Industrial Revolution. I am confident they will continue to strengthen the competitiveness of flexible sheet metal fabrication in North America. At the TRUMPF Smart Factory, our mission is to digitally connect production technology, to make it even more efficient, precise and flexible. In doing so, we want to make manufacturing more efficient in its upstream and downstream processes. This is how we build the industrial world of tomorrow. We are the market and technology leaders in machine tools and lasers for industrial manufacturing, and work with our innovations in almost every sector. Our products and software solutions are enabling technology that paves the way to the Smart Factory, allowing us to implement high-tech processes for industrial applications today and into the next generation.

Happy 5th Anniversary to the TRUMPF Smart Factory. We cannot wait to see what comes next!

The Smart Factory has advanced in the Industry 4.0 journey with a focus on automating operations, such as the cutting and bending processes.



Getting Connected with #TRUMPF

Social media connects people around the world. It can provide a space to communicate directly with customers and share ideas with the industry at large. TRUMPF recently asked followers to show us the creative ways they use their machinery. From across North America, manufacturers responded with photos and videos of finished parts, products and projects.

Edmonton, Alberta, Canada

Hideaway Screens

The TruLaser 1040 is used to create beautiful custom privacy screens and gates.



Langley, British Columbia, Canada

KSM Stainless Steel Fabricators Ltd.

Consistent, quality craftsmanship – a variety of custom tile designs are cut on a flat sheet laser.



Sonoma, California

Pfunder Metalwerks

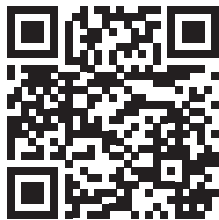
Precision technology helped build a stainless steel firepit complete with Corten steel sculpture.



Riverside, California

BK Customs Inc.

A pallet of custom parts from the TruLaser 1030 fiber is finished and awaits delivery.



Scan the QR code to check out TRUMPF Inc.'s Instagram profile! Be sure to follow TRUMPF on social media to stay up to date with the latest TRUMPF news, events and technology and tag us with your unique projects!



Las Vegas, Nevada

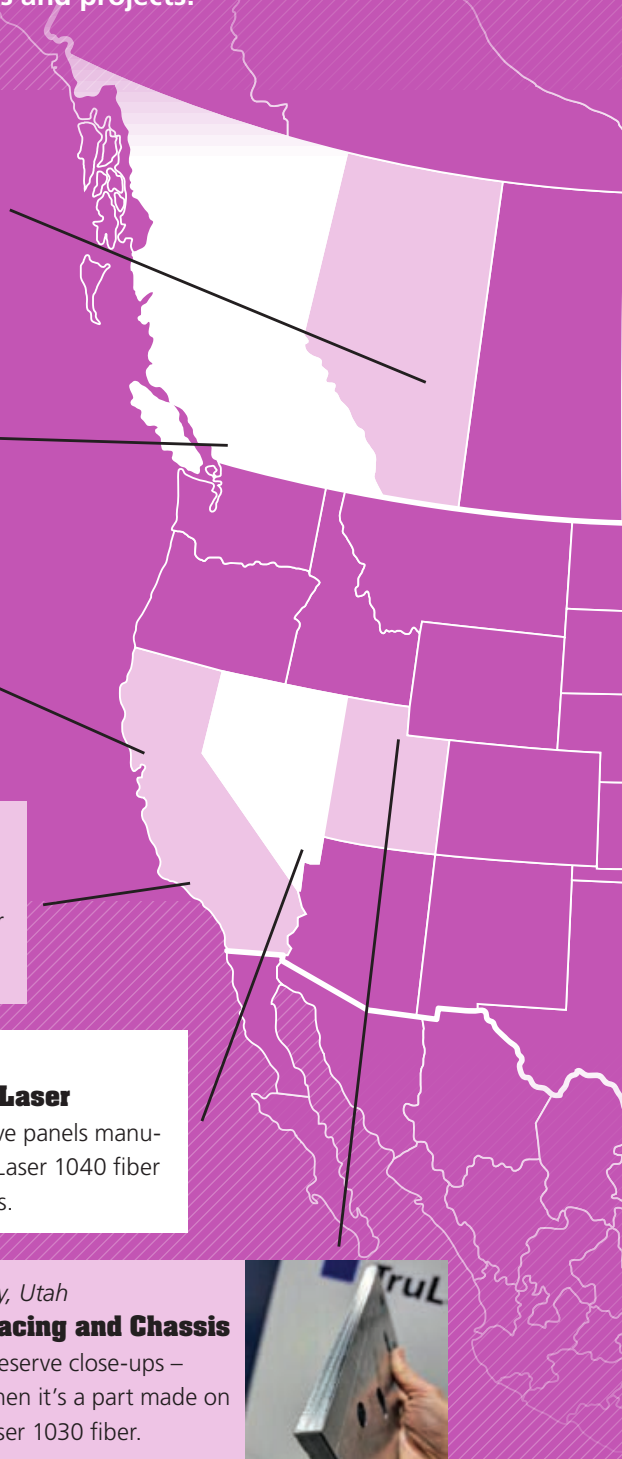
Precision Tube Laser

Freshly cut decorative panels manufactured on the TruLaser 1040 fiber meet high standards.

Salt Lake City, Utah

Overkill Racing and Chassis

Clean cuts deserve close-ups – especially when it's a part made on a new TruLaser 1030 fiber.





Manitoba, Canada

OCFab LTD

Tractor plows are made from 0.25 to 1 inch plate cut on a TruLaser 5040 fiber.

Chateauguay, Quebec, Canada

GMP Advanced Mechanical Solutions

A long-established Canadian fabricator shows a profile cut on the TruLaser Tube 7000.



Bucks County, Pennsylvania

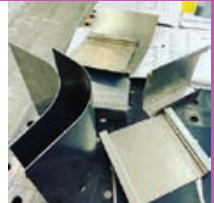
Caltech Manufacturing

This woman-owned shop cuts and bends parts with a TruLaser 1030 fiber and TruBend 2100.

Westbury, New York

Hamilton MetalCraft Inc.

A metal railing manufacturer shows off parts bent on a new TruBend 3170.



Spotsylvania, Virginia

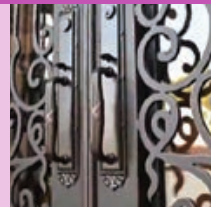
A5I Fabrication

A precision part is cut on the TruLaser Tube 3000 for the defense, aerospace, and other markets.

Memphis, Tennessee

Tuscan Iron Entries

A luxury door company opens up improved quality and efficiency by adding a TruLaser 1030.



Davie, Florida

US Anchor

A lean manufacturer uses a TruLaser 1040 to cleanly cut in 1-inch stainless steel with nitrogen.



Kansas City, Missouri

AT Industries Inc.

In a cool design, 10 gauge stainless steel is laser cut and bent into industrial duct systems.

Check it out!

WHAT HAPPENS IN A SMART FACTORY?

The TRUMPF Smart Factory in Chicago is a testament to the company's comprehensive expertise in solutions for **connected sheet metal fabrication**. Let's take a look behind the scenes.

A total of **40 satellites** that use Track&Trace to locate individual orders ensure an overview of the production process at all times.



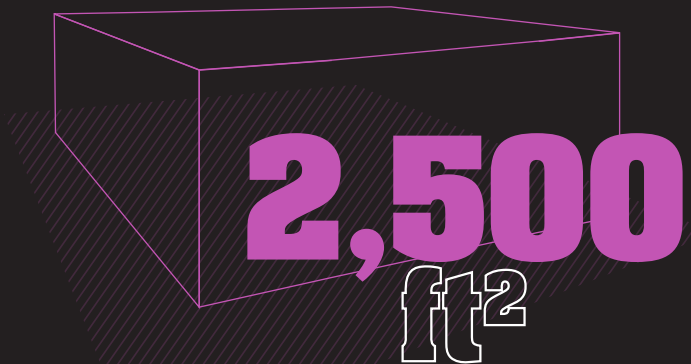
The Smart Factory in Chicago has about **15 employees** to demonstrate processes, machines and solutions to customers.

Driverless forklifts ensure seamless transportation.

They drive back and forth between **15 docking stations** in the smart factory.



In an area measuring **2,500 square feet**, **eleven machines** operate in various levels of automation.



12

million dollars

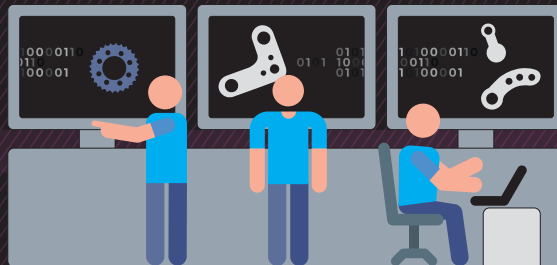
The machines and systems have a total value of **12 million dollars**.

TRUMPF **partners** play a key role in the running of the smart factory. Examples include the driverless transport system from **Jungheinrich**, and a large-scale storage system from **STOPA**.

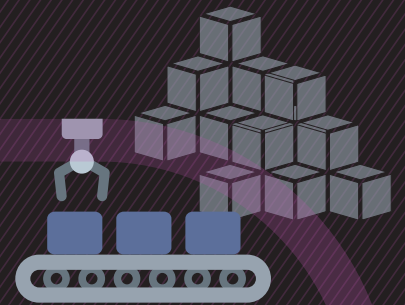




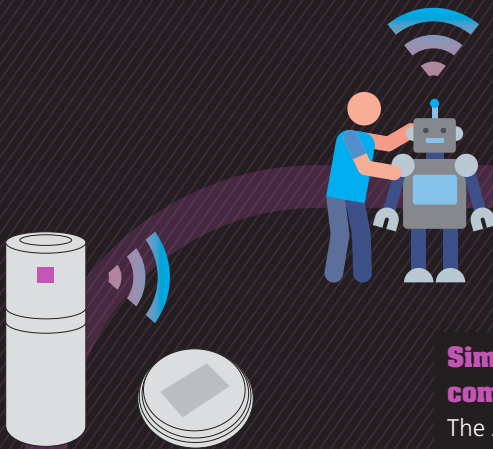
Mouse clicks instead of paper drawings: The customer orders the part online. Complex drawings on paper and tedious ordering processes are a thing of the past.



Efficiency instead of chaos: The control center is where all the data come together. This speeds up throughput times enormously.



Automation instead of muscles: An automatically controlled storage system ensures that all the required materials are always available.



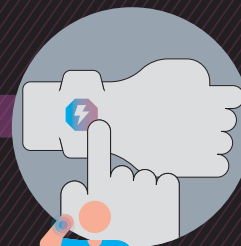
Simple instead of complicated: The AI assistant helps with sorting and prevents errors.



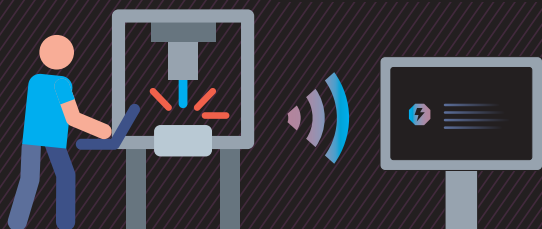
Production instead of logistics: The driverless transport systems bring the components to the next production step – employees can fully focus on production.

Knowing instead of searching: The orders can be located in the production process at any time.

Nonstop operation instead of downtime: When a machine stops, a notification is sent to the employee's smart watch, tablet or PC, and they can take immediate action.



Fast instead of slow: When the component leaves the factory after a short lead time, this information is immediately sent to the control center and to the customer.





Interesting. Worthwhile. Surprising.



Laser welding for all

In an effort to help companies get started with automated laser welding, TRUMPF will be presenting its new TruLaser Weld 1000 at FABTECH. In many production facilities, workers still weld components by hand – a time-consuming process that leads to higher costs. Current systems for automated laser welding tend to be large, expensive and complex to operate, with very few of the kind of low-cost solutions that companies need to start out in this business. At last, smaller companies can benefit from the advantages of automated laser welding, so they can boost the productivity of their production processes and gain a greater competitive edge. The new system is particularly suitable for job shops that weld products such as electrical cabinets, sheet metal boxes and covers.



Perfect material flow with TRUMPF's new Oseon software

Oseon software helps companies achieve fully automated material flow in their production facilities without having to invest in a large-scale storage system. Operators use Oseon to schedule their production processes, and the machines on the shop floor continuously send process data back to Oseon. The software also receives information on each batch and on the location of carts and automated guided vehicles (AGVs). The system works by labeling pallets with barcodes which workers scan when they load a machine, thereby “wedding” the pallet to the batch. Once the cart is empty, they simply push it into one of the special docking stations developed by TRUMPF. Alternatively, the material is transported from A to B by an AGV. As soon as the cart or AGV has “docked,” the docking station sends the corresponding information to Oseon. This provides the software with all the data it needs to organize efficient material transportation. Oseon can also automatically send transportation jobs to workers with carts and to AGVs. Oseon is a great choice for any sheet metal fabricator looking to boost the competitiveness of their production activities. The software can be used with machinery that is still in the earliest stages of digital connectivity as well as in smart factories, whatever the size of the company. Thanks to its open interfaces, Oseon is also suitable for users who want to include machines from other providers in their connected manufacturing system alongside TRUMPF machines.



Countersinks and bevels with a laser

EdgeLine Bevel technology allows operators to apply bevels and countersinks during laser cutting. The laser produces angles on part contours and has the ability to countersink holes and bevel edges for weld preparation – without a 3D cutting head. EdgeLine Bevel cuts costs and saves time by combining multiple steps. By eliminating the need to prepare weld edges using grinders and angle grinders, this new function can replace the workstations previously required to create countersinks manually. The technology retains the ability to tackle a full range of contours, allowing users to machine parts with straight edges, as well as those with more unusual geometries. EdgeLine Bevel can be used to apply bevels up to 45 degrees and various sizes of countersink – and the programming is simple and fast!

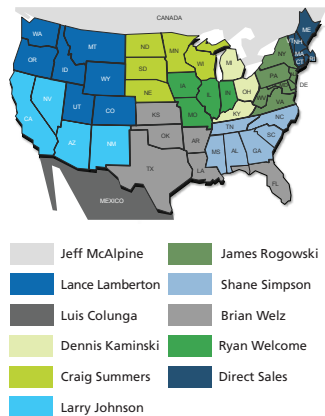
BIZ+
SHORT CUTS



TRUMPF Photonics celebrates 20 years

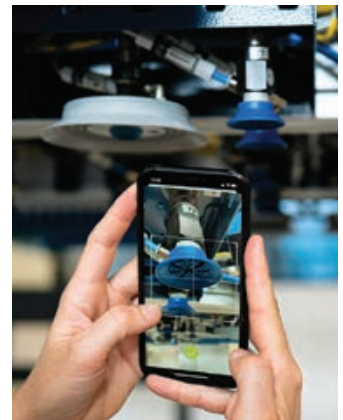
Over the last twenty years, TRUMPF Photonics has grown to become the largest high-power bar-based semiconductor laser manufacturer worldwide. TRUMPF purchased the Cranbury, New Jersey company, formerly known as Princeton Lightwave Inc. (PLI), in 2002 to expand semi-conductor and wafer production. The lab's initial mission was to develop a laser diode that had higher reliability than competing products.

Today, the company supplies the high-tech pump modules for solid state lasers like the TruDisk and the TruMicro, optical coating and component for TRUMPF's CO₂ and EUV business. They are also developing and selling laser chips to the external market. "It has definitely been a success story," says TRUMPF Photonics Managing Director, Konstantin Bouck. "With about 100 million U.S. dollars in sales per year, a long track record of developing and delivering excellent products, a strong team, and deep technological know-how, we are well prepared for the future."



Sales territory changes

TRUMPF Inc. has added two new Regional Sales Managers – Ryan Welcome and Lance Lamberton – to the machine tool regional sales management. In addition, the company has reorganized other areas of responsibility. Ryan Welcome has joined the TRUMPF Inc. sales team in the midwest and will serve as Regional Sales Manager for Iowa, Missouri, Illinois and Indiana. In September, Lance Lamberton became the Regional Sales Manager responsible for the states of Washington, Oregon, Idaho, Montana, Wyoming, Utah and Colorado. In addition, Jim Rogowski's territory has extended to cover New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and West Virginia.



AI helps customers order spare parts

TRUMPF has introduced a new system that harnesses artificial intelligence to identify snapshots of spare parts and place orders automatically. All users need is a cellphone photo and the Easy Order app. In the future, this will allow machine operators to identify and order replacement parts in a matter of seconds. The process of pulling out a cellphone and taking a picture couldn't be easier, and the system already covers 10,000 different parts. "Wear and tear on the shop floor can make it impossible to read material numbers on spare parts," says Christine Benz, head of TruServices and Smart Services at TRUMPF Inc. "The AI solution should make problems like these a thing of the past."



SMART SAVINGS: WITH TRUMPF PART OPTIMIZATION

“Less is more” would be a great motto for the philosophy behind TRUMPF part optimization. Through part-design workshops and consulting, TRUMPF teaches users how to get the best out of their machines to make their production more efficient and cost-effective. The ultimate goal is more quality at less cost.

In this series, TRUe will highlight various parts to show how this process works and what design principles users should focus on.

This issue:

Utilizing the negative space and symmetry with sheet metal

In today’s world of manufacturing, everyone is looking to gain a competitive edge with their product. Simply investing in high-end sheet metal fabrication equipment does not guarantee that savings will follow. If designs stagnate and remain based in previous manufacturing methods and machines, new opportunities and cost savings are squandered. When bringing in new machinery, products should be reviewed and thoughtfully redesigned to utilize the new technology to its full potential.

A perfect example of how to maximize the high precision and accuracy of TRUMPF laser cutting and bending technologies is the roller stand highlighted here. The original design has six parts, four welds, requires a fixture, and parts with one bend. The parts nest compactly, and the press brake only requires a simple set up, but the manufacturing time per assembly is high.

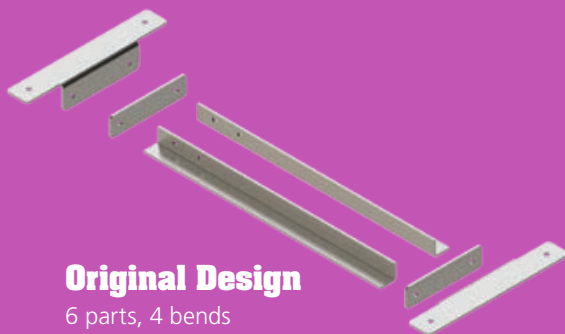


Taylor Wright
Mechanical Project Engineer
& Smart Part Consultant

Smart Part Consulting consists of reviewing parts and assemblies at the customer’s site and teaching their team how to optimize sheet metal designs for production using their equipment. Taylor Wright also teaches a three-day course called Sheet Metal Design offered at the TRUMPF training facilities in Farmington, Connecticut and Santa Clara, California. Customers can sign up using the training portal or by calling 860-255-6068.

If the product is redesigned using modern sheet metal methodology, then welds can be converted to bends to create a single part containing eight bends. Welding is eliminated, which saves time and prevents quality issues and the need for costly fixtures. The negative space between the rails is used to double up on material and create strong connection points, and the design is made symmetric to further “mistake proof” the process. Additional bends increase the strength at the wheel locations.

At first glance, the redesigned bent part may look intimidating to manufacture, but TRUMPF equipment can handle parts like this with ease, saving you time and money.



Original Design

6 parts, 4 bends

Manufacturing methods used:

Laser cutting, bending, welding

Cost: \$32.65 **Weight:** 1.51 kg

Better fabricated part

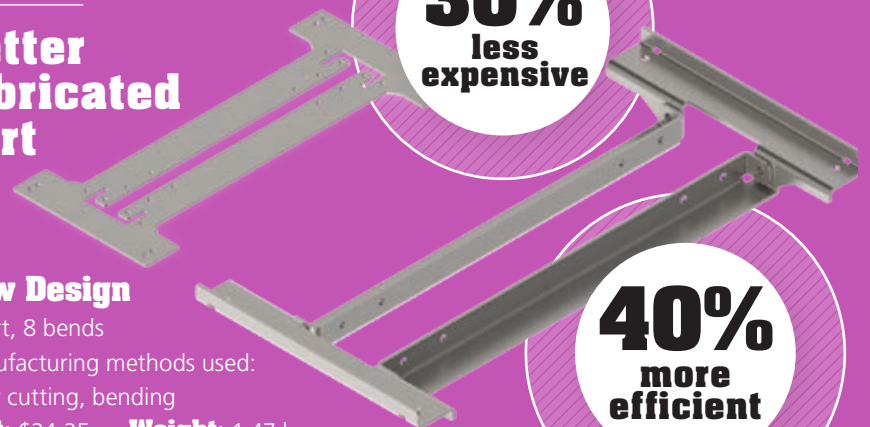
New Design

1 part, 8 bends

Manufacturing methods used:

Laser cutting, bending

Cost: \$24.25 **Weight:** 1.47 kg



30%
less
expensive

40%
more
efficient

pARTgallery



Technology transformed into art. Presenting parts in a new light is something we do in every issue of TRUe. This picture shows the **nozzles of a laser-cutting machine** as you've never seen them before. By taking the cutting nozzles out of their familiar environment, photographer Lucian Mitiu helps us see them from an entirely new perspective.

CONNECTIONS

Making Connections

I have been thinking about connections a lot these days. It seems that some people are driven to make a connection purely for their own personal gain, rather than out of doing what is right. That is unfortunate. This self-interested approach perpetuates cynical attitudes about personal relationships and can be insidious in private, as well as public, corporations and institutions.

Over the course of my career at TRUMPF, I have witnessed many people make friends – not just connections – with colleagues and customers. These relationships develop from a place of sincere curiosity, trust, interest, and a desire to help. They are not insincere, transitory, and purely transactional. Just the opposite.

Edwin Stanley comes to mind as a good example. Edwin, the former vice president of operations at GH Metal Solutions in Alabama, is a softspoken southerner with the mind and mannerisms of an engineer. Many years ago, he wanted to learn as much as he could about how a TRUMPF laser really worked. He was told that Joe Troiani, an applications engineer from TRUMPF, by way of State College, Pennsylvania, was the man to teach him. But Joe was always busy (and intense). If you wanted Joe's attention, you had to keep up with his thinking, which he did best while walking. And Joe was a fast walker and talker. At one FABTECH show, Joe walked from our hotel on the North side of the Chicago River to McCormick Place, which is on the South side – two miles away – during the early morning hour of each day of the show. So, Edwin walked with him. Step for step, he listened to Joe explain how a TRUMPF laser worked to cut an infinite number of complex shapes out of different kinds

of metal, both precisely and rapidly. And along the way the two got to know each other – they connected – and a lifelong respect and friendship developed. I will never forget seeing the two of them set off together even before the sun had risen over Lake Michigan.

Making connections fulfills a critical human need but is also important to machines and systems. Linking different autonomous machine tools together can dramatically improve the efficiency and productivity of a precision sheet metal fabrication operation. In such a Smart Factory enterprise, the machines are communicating with one another and relying on each other to accomplish a variety of tasks with very little pause or interruption. In time, the TRUMPF machines learn to coordinate and optimize their performance, and connections strengthen – now that sounds a lot like a lifelong friendship.

The manufacturing world of today demands a broadening of connections in our supply chains. Relying on only one connection is efficient, unless a link breaks. There is an urgent need to design and develop supply chains that are dynamic and global, as well as local and multi-dimensional. It is imperative to establish new connections, at every level of the manufacturing process, to ensure stability of the supply chain. At TRUMPF, we are working rapidly to do exactly that as we devote ourselves to helping our loyal customers improve and succeed.

-Burke Doar



TRUe #09

IMPRINT

Publisher

TRUMPF Inc.
111 Hyde Road
Farmington, CT 06032
WWW.TRUMPF.COM

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