

TRUF

THE MAGAZINE FOR SHEET METAL EXPERTS

01 Pennsylvania

Field of Dreams:
Expanding business to become a
complete service provider

02 Wisconsin

Jump Right In:
Working hard to
achieve success

07#2021 PROGRESS

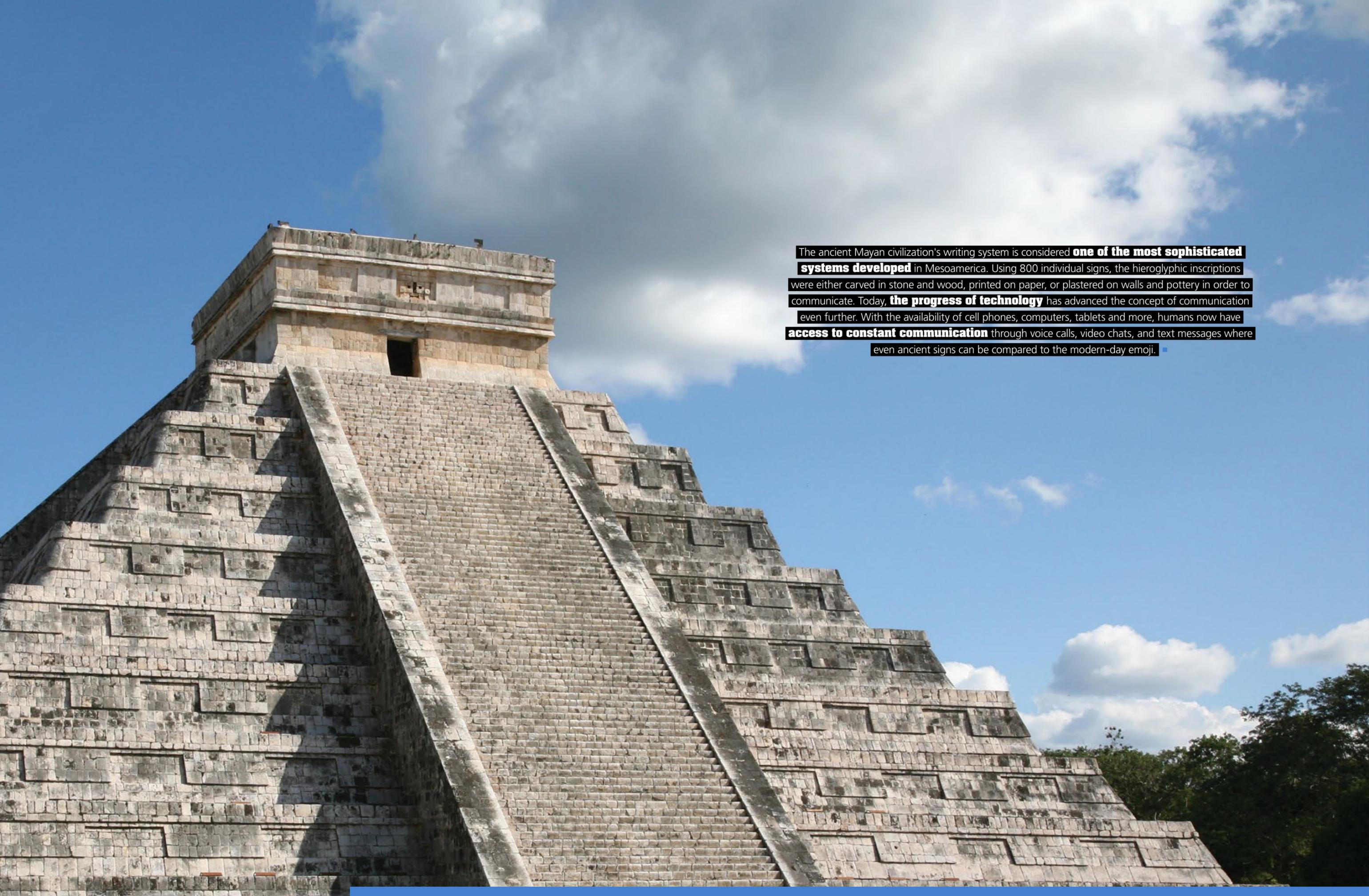
03 Connecticut

Progress in Production:
Improving processes
to optimize efficiency

04 Technology

Laser Welding Advancements:
Advancing technology to
eliminate operator pain points





The ancient Mayan civilization's writing system is considered **one of the most sophisticated systems developed** in Mesoamerica. Using 800 individual signs, the hieroglyphic inscriptions were either carved in stone and wood, printed on paper, or plastered on walls and pottery in order to communicate. Today, **the progress of technology** has advanced the concept of communication even further. With the availability of cell phones, computers, tablets and more, humans now have **access to constant communication** through voice calls, video chats, and text messages where even ancient signs can be compared to the modern-day emoji. ■



On August 29, 2005, Hurricane Katrina swept through the Gulf Coast leaving 85% of New Orleans, Louisiana under water causing an estimated \$100 billion in damage. Although **much of the city has been able** to find its rhythm again through the spirit of community, music, and creole cuisine - the rebuild of many communities in New Orleans still remain **a work in progress**, even 16 years later.



Progress can be defined as a **forward or onward movement** toward a destination or goal. During the 1936 Berlin Olympics, the US rowing team from the University of Washington **shared a vision for gold. Although deemed underdogs**, team USA progressed in the competition like no one could have imagined. Against all odds and through hard work and dedication, the team **rowed their way to a gold metal finish.** ■



EDITORIAL



At TRUMPF **we consider learning and development fundamental** to our customers' **growth and success**, as well as to ours.

In this issue of TRUe, we explore what's possible as businesses place greater emphasis on adapting to change with a clear focus on learning and development. To achieve our goals, both personally and professionally, it is important to have the right set of tools at our disposal and the right training to use those tools efficiently and effectively. Those tools change over time, requiring new technologies, new capabilities, and continual process improvements. At TRUMPF we are proud to offer a portfolio of learning opportunities to our customers to help you increase efficiency and optimize speed and quality in your operations. I am particularly pleased to share with you that over the past year we have grown our list of course offerings that are available both in-person and online. We hope that you will take advantage of these learning and development opportunities. Also, within TRUMPF, we are continuously providing trainings and learning opportunities for our own employees to ensure that they have the knowledge and expertise to provide you with the best products, training and support possible.

In this issue, we highlight two customers whose focus on adapting to change through learning and development have led to innovation and growth as they forged new paths. In Pennsylvania, we talk with Chris Miller, President of Viocity Group, who drives home the importance of responding proactively to change, prioritizing employee training to optimize efficiencies, and developing close partnerships to achieve the family business's

ambitious goals. In Wisconsin, we visit Brunner Fabrication where COO Matt Brunner shares their journey from a family auto body repair shop to a high-volume fabrication facility. He recounts how taking risks, seizing new opportunities, and continually improving production processes through training and development have been key to their success.

Finally, in an interview with Vice President of Production, Peter Hafner, we highlight the progress we have made in our own facility through training and development. He describes improvements in flexibility, versatility and customer responsiveness that have led to increased efficiency on TRUMPF's production floor, and which translate into efficiency improvements for our customers.

Our goal as your trusted partner is to support you each step of the way toward greater growth and success.

PETER HOECKLIN, PRESIDENT & CEO

TRU^e

Table of contents

#07/2021

PROGRESS ...

01

... in Manheim

President Chris Miller discusses how a leap of faith has helped to develop Viocity Group into the complete service provider it is today.

Page 12

... in Manitowoc

Matt Brunner, COO of Brunner Fabrication, LLC, drives home the importance of a strong work ethic in order to achieve your dreams and pursue future growth.

02

Page 18

... in Farmington

We get an inside look into how production at TRUMPF's US headquarters began and how it has progressed during an interview with Vice President of Production, Peter Hafner.

Page 24

03

... technology

Laser welding technology is continuously evolving – read about TRUMPF's latest advancements which enable customers to stay current with the trend.

Page 28

04

Editorial	08
01 Viocity Group in Manheim, Pennsylvania	12
02 Brunner Fabrication, LLC in Manitowoc, Wisconsin	18
03 TRUMPF Production in Farmington, Connecticut	24
04 Technology: Laser Welding Advancements	28
Shortcuts BIZ + TECH	32
Aha! Facts	34
pARTgallery	35
Column	36





01

PENNSYLVANIA

New opportunity in Manheim

FIELD OF DREAMS

On a drive through Lancaster county's rolling hills, you'll find beautiful farmland and miles of corn fields that over the years have lent themselves as the base of dreams and opportunity for many - including Manheim based Viocity Group. Within these fields the group has been able to expand upon previous business ventures and even create new ones with the goal to become a complete service provider for current and future customers.

The Start of Something New

Whether it be industrial fabrication, mechanical contracting, industrial electrical services, or commercial and industrial construction, the Viocity Group takes pride in their ability to support their customers as a complete service provider. But they did not always have the capabilities they do today recalls President Chris Miller, “We first started in a small garage as a weld shop only.” That was back in 1949 when the company was originally founded as Herr & Sacco, Inc. which is known today as H&S Industrial. Over the years the business continued to grow by taking on welding jobs from local manufacturing companies – eventually adding design, fabrication, installation, millwright and rigging services.

In 2006 with the passing of his father, Chris had to quickly shift gears from a Project Manager and assume responsibility as the company President. Having already been involved with H&S for over 12 years, Chris looked ahead at the opportunity to further develop a new future. “Change is necessary and critical to the long-term success of a company,” he stated.



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“Change is critical and necessary to the long-term success of a company,”

Jumping Right In

While H&S was able to meet the needs of a broad customer base there was still interest in pursuing a different type of work – repeat and high volume. At the time much of the layout work and the cutting of parts was still done the old-fashioned way and to stay ahead of competition, H&S was looking for that next advantage. It was anticipated that their next calculated gamble would be stressful for many, however, it would be a step that was necessary to remain competitive and innovative among the fabrication markets.

After exploring several options, the decision was made to invest in a flat sheet laser to supplement the current H&S business and to offer the opportunity to serve a new customer base. So, with no previous exposure to laser cutting and no customers who were interested in a laser cutting only service at that time, purchasing their first laser truly was a leap of faith. When they first invested in the TruLaser 3030 fiber in 2015, what’s known today as Nitro Cutting was just a dream. But always looking ahead, the decision was made to brand this new capability differently than H&S due to the type of work it could create and the customer base it could bring in, eventually leading to the formation of Nitro Cutting.

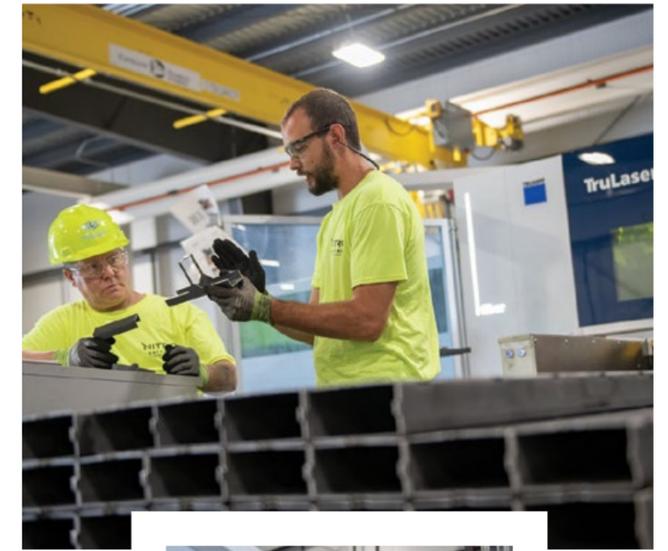
A bird's eye view of Nitro Cutting's tube laser area.



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“We recognize training as an opportunity to further develop our employees' efficiencies in their daily activities,”



A Nitro Cutting employee loads raw material into the TruLaser Tube 7000 fiber.



No Walk in the Park

This new business venture did not take off overnight, in fact when the machine was first installed at H&S, there was no work for the TruLaser 3030 fiber except for processing components to support the H&S line of business. Over the years Chris had heard that growth was one of the toughest things a business will go through, and this was starting to be felt. While the leaders of the organization saw the benefits of this additional offering, many within the H&S organization remained skeptical. Chris felt that in some ways growth could be equated to a bus pulling up and everyone being asked to jump on without knowing where it was going or why, but still expecting everyone to be excited about it. However, he knew that individuals desired almost the complete opposite, looking for details, clarity and the time to digest what this new venture meant.

But growth can sometimes be subject to rapid change, not always offering the opportunity for many details on the path forward. With the creation of Nitro, one of the largest hurdles was trying to assure individuals that this was not replacing or downplaying H&S' significance in any way. In fact, it was an effort to strengthen H&S

by offering the business a more consistent flow of work and an opportunity to gain new customers. This initiative was demonstrated over time and individuals started to buy into the new business offering. So much so that even a long-term employee with nearly 30 years under his belt left the familiarity of H&S to join the Nitro Cutting team.

Creating Something from Nothing

Given that there was limited work to run on the laser, the company took it as an opportunity to send employees to TRUMPF in Farmington, CT for training – but even after training, the customer base was not yet there to allow the machine operators to hone in on their skills. In the meantime, they started to create things to test and challenge not only their skills as operators but the capabilities of the machine. “We started to create things just to see what the machine could do,” Chris mentioned “and to really test the intricacy of the machine we began cutting metal butterflies.” Little did they know that two years later these butterflies would become the basis and symbol of a new company non-profit known as Hope in the Air. The organization leaders talked about putting together a

fundraiser for a number of years and when a date became available for an event, Hope in the Air was quickly created. From January to September all aspects of Hope in the Air needed to be established and the decision was finally made to incorporate those metal butterflies into the yearly theme due to the connection with hope. Each year the non-profit focuses on one or more of the following areas to support: veterans, child life programs and animal welfare. For Viocity, it was important to bring attention to programs that were not supported by their own corporate structures. The group's ultimate goal is to have the communities continue to support these causes following their introduction through Hope in the Air. During the first four years of the company's Hope in the Air gala, over \$350,000 has been raised for these causes.

Getting Down to Business

When Nitro Cutting's new facility was built in August 2016, the TruLaser 3030 fiber still had less than a day's worth of work each week, but soon after, the company's customer base began to grow. These new customers were looking for exactly what Nitro set-out to provide – a company with the ability to produce a high volume of part orders quickly and efficiently. The intent to continue growing the business also drove the decision to retrofit the laser with automation which included a TruStore storage system and a LiftMaster Compact followed by the purchase of a TruBend 5130. "TRUMPF equipment has allowed us to build and form partnerships with new customers," Chris stated. "The machine capabilities and design efficiencies have even opened the doors for crossover work between Nitro Cutting and H&S."

Center (pictured from left to right): Vice President, Sasha Wawrzyniak, President, Chris Miller, and Director of Manufacturing and Process Improvement, David Moon alongside Nitro's dedicated workforce.



In 2019 Nitro expanded its sheet metal fabrication competences one step further with the purchase of a TruLaser Tube 7000 fiber. "There is a lot of competition around with flat lasers, but not very many with the ability to process tubes so again, this was just another opportunity to grow our customer base and offer even more to our current customers," Chris recounted. Nitro now has a total of 7 employees who run full shifts, lights out opportunities, and overtime on almost all their TRUMPF equipment.

Staying True to the Roots

Today, the excitement from the employees who were a part of the initial journey of growing the business to what it is today is apparent. As the company continues to progress, it remains important for them to uphold the core values that were put into place over 70 years ago. Of those values, dedication to their employees and customers is still the main focus - and by adding new efficiencies and technologies they have been able to continue supporting that goal as a business.

Another important aspect that reinforces that core value of dedication, is continued education for employees. As an organization, Viocity fully supports additional learning from machine training to software courses. "We recognize training as an opportunity to further develop our employees' capabilities in their daily activities," explained Chris. "It also directly translates back to our customers since we are then better equipped with the skills to provide them the best service possible."

What's Next

For Nitro Cutting, business is full steam ahead. With customers in industries such as life science, construction equipment, specialty vehicles and material handling equipment, the company is set to expand their TRUMPF equipment portfolio with a TruLaser Tube 5000 fiber later this year. This winter, Viocity Group even has plans to launch a new company which will be supportive of Nitro. Chris noted, "By adding new technologies and capabilities, we are able to continue progressing and succeed outside of what we have already done."



In Brief

Viocity Group Machine Portfolio



TruLaser 3030 fiber

The TruLaser 3030 fiber uses TruDisk laser technology to reliably and quickly achieve high-quality cuts in thick and thin material. In addition to excellent part quality, the high-performance machine facilitates seamless part removal and better material utilization. The machine is compatible with a wide variety of options for automated loading and unloading of parts.



TruBend 7036

The TruBend Series 7000, with its high speeds and acceleration values, ensure outstanding productivity. The electric TruBend 7036 provides the optimal conditions for large press forces at a high working speed. The ergonomic press brake's 6-axis backgauge guarantees positioning of components with remarkable precision.



TruBend 5130

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.



TruLaser Tube 7000 fiber

The TruLaser Tube 7000 fiber achieves record speeds in laser cutting tubes and profiles with a diameter of up to 10 in. and wall thicknesses of up to 0.4 in. for mild steel. This flexible high-end machine expertly handles a wide range of parts and laser tube cutting applications.

The customer

Viocity Group

Chris Miller, President
1831 Auction Rd, Manheim, PA 17545

Phone: 717-492-8325
www.viocitygroup.com

- TruLaser 3030 fiber
- TruLaser Tube7000 fiber
- TruBend 7036
- TruBend 5130



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

02

WISCONSIN

*Hard work advances fabrication
business in Manitowoc*

JUMP RIGHT IN

Midwesterners are famous for their work ethic, but even among Wisconsinites, Matt Brunner works especially hard. Starting every morning at four a.m., Brunner ensures that hundreds of thousands of pounds of steel continuously, and quickly, leave Brunner Fabrication, LLC as high-quality cut, bent, and welded parts. In the three years since Matt converted his father's Manitowoc-based auto body repair shop into a high-volume fabrication facility, the business has advanced at lightning speed.





“Sometimes you have to dive in headfirst, You can’t be afraid to try something new or be tired.”

Diving In to Meet Demand

Growing up and working in his father’s auto body repair shop, Matt Brunner developed a solid work ethic and a knack for fixing things. In subsequent jobs at two large Wisconsin manufacturers, Brunner built a reputation for doing everything necessary to keep the company’s machines producing high-quality laser cut parts, even if that meant working eighteen-hour days. Brunner noticed that both companies, despite having millions of dollars of the latest laser technology, still had overflow work. “That’s when it hit me,” says Brunner, now Brunner Fabrication’s Chief Operating Officer, “the demand was there for a business that could provide a high volume of parts in a short time.”

In late 2017, Brunner’s wife Tera encouraged him to leave his job, go into business with his father Chris, and transform the family auto body repair shop into a high-volume fabrication facility. “Sometimes you have to dive in headfirst,” Brunner insists. “You can’t be afraid to try something new or be tired.” The newly-formed Brunner Fabrication installed a TruLaser 2030 and a basic press brake. Brunner and Chris – with Tera, Brunner’s mom Tracy, and a laser operator – worked around the clock to fill orders for two local companies: a producer of performance race suspensions and Brunner’s previous employer, an appliance manufacturer.

Supporting Ambitions

Two years later, Brunner Fabrication had expanded twice and installed a TruLaser 5030 fiber with automation and TruBend 7036. Brunner pitched his new laser cutting and bending capabilities to Ariens, a local agricultural equipment manufacturer where he’d first worked with automated TRUMPF fiber lasers. During a Fall 2017 meeting, Ariens’ CEO recalled a conversation five years before, when Brunner still worked for Ariens and confidently predicted, “one day, I will be cutting your parts.” Ariens placed an order requiring daily delivery of twelve to twenty pallets of parts.

Brunner’s road to growth wasn’t completely smooth, but TRUMPF supported the company whenever it hit a bump. “If something happens – which it will with any machine – it doesn’t matter the time or day, even holidays, TRUMPF is always there to help,” says Brunner. Over one Thanksgiving holiday, TRUMPF technicians worked to optimize Brunner’s refurbished fiber laser cutting machine, while the TRUMPF Smart Factory stepped in to help cut and bend parts for a large order. “TRUMPF supported us every second,” says Brunner. “We never missed a deadline.” The Chicago Smart Factory experience also opened Brunner’s eyes to new bending possibilities, inspiring him to purchase a TruBend 5085 in 2020.

A Boost Forward

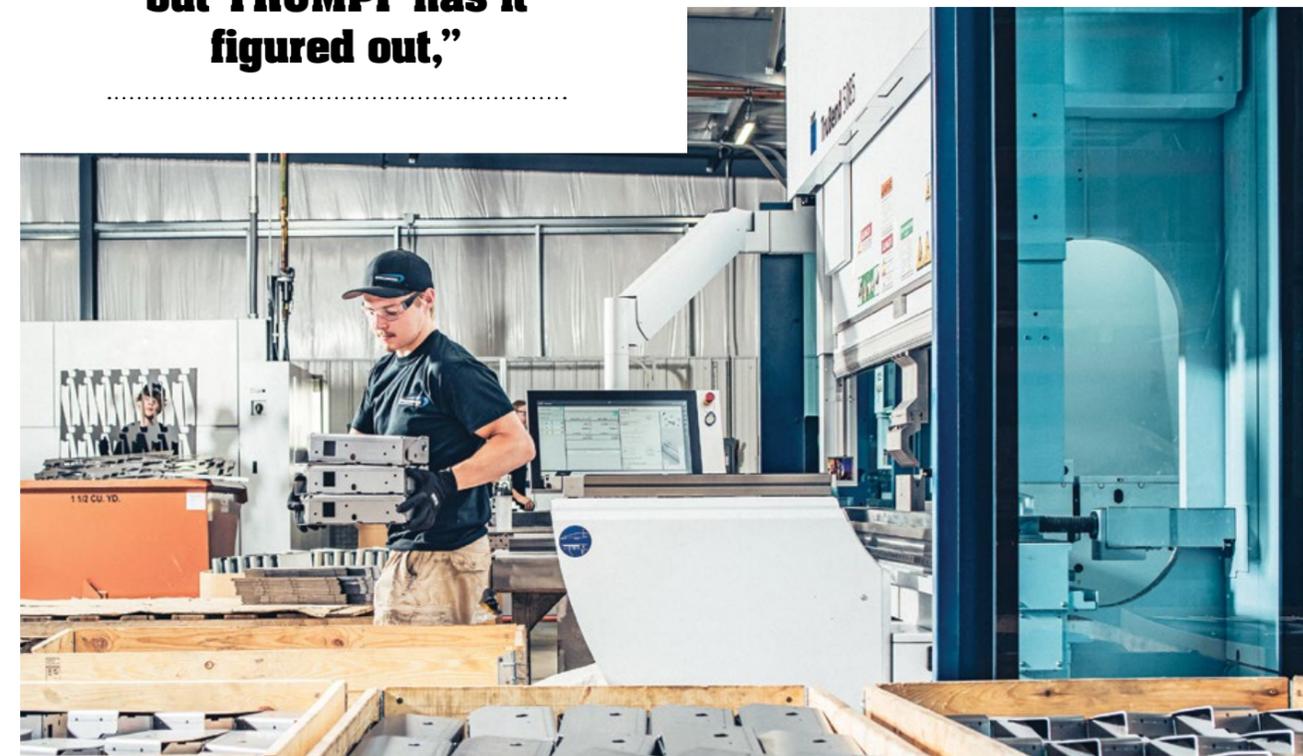
Now, Brunner’s TruLaser 5030 fiber is fine-tuned to quickly cut high-quality parts and process up to 120,000 pounds of steel weekly. This combination of speed, quality, and high volume creates Brunner’s competitive advantage. “There’s nobody around with a niche like ours,” he says. “With excellent press brake operators and the TruLaser 5030 fiber cutting so fast it nearly flies, we can turn around crazy amounts of parts.” Automating the laser process further propelled Brunner’s productivity. “Automation allows us to maximize every minute we’re here cutting,” he explains. “We have days with 90-94% uptime on the beam. We could never achieve that manually.”

Brunner also credits TRUMPF’s Boost programming software for its role in optimizing production. “Speed and quality don’t usually go hand-in-hand, but TRUMPF has it figured out,” Brunner emphasizes. “I press the orange Boost button, and everything comes out perfectly. We only have about 8-15% scrap.” Additionally, Boost saves time. “Because of Boost, I can turn around quotes quickly,” he says. “When customers give us 3D files, we can program the parts ‘start to finish’ in 30-60 seconds, and I can quote the job in another two minutes.” This gives Brunner extra time to listen closely to his clients’ needs. He adds, “even if it’s a part they’ve made for a decade, we work together to perfect the part’s manufacturability.”

“Speed and quality don’t usually go hand-in-hand, but **TRUMPF** has it figured out,”



Pictured above: Stacks of 3/16" HRPO steel produced on Brunner's TruLaser 5030 fiber.





Chief Operating Officer, Matt Brunner

“If you have the ability and drive, you have to go for it. If it doesn’t work, you adjust.”

Efficient Growth

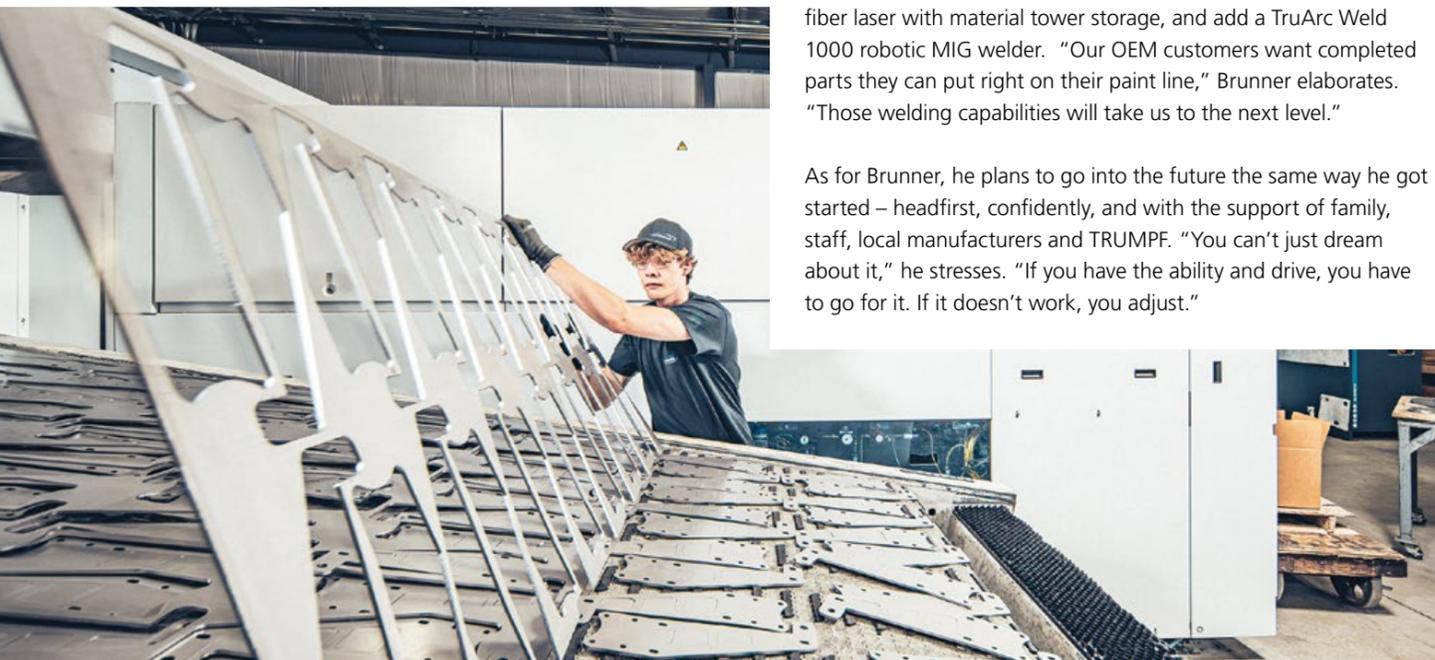
Despite the unprecedented global economic challenges caused by the COVID-19 pandemic, Brunner Fabrication thrived. “We do lots of agriculture and defense work, so we never shut down,” recalls Brunner. “I was nervous at first, but then we started getting huge requests for permanent parts.” The pandemic’s silver lining was that it refocused the company on its specialty: perfecting high-volume parts. “Before we were trying to do high-volume while supporting smaller jobs, but that wasn’t efficient. Now our efficiencies are through the roof,” Brunner declares proudly. Brunner’s revenue reflects the efficiency increase. Last year, company sales figures doubled to nearly \$2 million, and this year, Brunner estimates he will reach \$4 million, with just one shift.

Brunner is excited about the increasing throughput that the numbers show. “I focus on how much material we put through and how fast we process it,” says Brunner. “Another sign of our progress is our team. Last year we had one laser operator and now we have six full-time employees, not including family.” Brunner acknowledges a key factor in his success is his support network, especially his expanding team, who share his “quality, done right, and fast” philosophy. Brunner’s father, mother, and wife have all contributed to the business growth.

Future Aspirations

Just as his father’s automotive business gave him a platform to launch the fabricating business, Brunner wants to build a business for subsequent generations. When his preschool son, the youngest of three boys, visits the business, he wears gloves and safety glasses and says he is ready to work. To provide a bright future for his family, Brunner strives to achieve \$20 million in sales and be featured on The Fabricator’s Fab 40 list by 2025. To achieve that goal, Brunner plans to expand again, start a second shift, buy another fiber laser with material tower storage, and add a TruArc Weld 1000 robotic MIG welder. “Our OEM customers want completed parts they can put right on their paint line,” Brunner elaborates. “Those welding capabilities will take us to the next level.”

As for Brunner, he plans to go into the future the same way he got started – headfirst, confidently, and with the support of family, staff, local manufacturers and TRUMPF. “You can’t just dream about it,” he stresses. “If you have the ability and drive, you have to go for it. If it doesn’t work, you adjust.”



In Brief Brunner Fabrication, LLC Machine Portfolio



TruLaser 5030 fiber

The TruLaser 5030 fiber is a cost-effective and reliable high-performance solid-state laser system combining top of the line laser cutting features and speed with reproducible, high part quality, even for complex contours. Users of this productive machine can achieve excellent feed rates with up to 12 kilowatts of laser power. Fully automated load/unload capabilities can be integrated with this machine.



TruBend 7036

The TruBend Series 7000, with its high speeds and acceleration values, ensure outstanding productivity. The electric TruBend 7036 provides the optimal conditions for large press forces at a high working speed. The ergonomic press brake’s 6-axis backgauge guarantees positioning of components with remarkable precision.



TruBend 5085

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.



TruLaser 2030

The compact TruLaser 2030 machine utilizes CO₂ laser technology for fast, reliable and flexible operation. The well-rounded machines combine high performance with perfect, micro-burr-free cutting results.

The customer

Brunner Fabrication, LLC

Matt Brunner, Chief Operating Officer
2816 N Rapids Rd, Manitowoc, WI 54220

Phone: 920-686-1278
www.brunnerfab.com

- TruLaser 2030
- TruLaser 5030 fiber
- TruBend 7036
- TruBend 5085



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



03
CONNECTICUT

Keeping customers in mind every step of the way

PROGRESS IN PRODUCTION



During an interview with Peter Hafner, Vice President of Production at TRUMPF Inc., we get an inside look at the changes that have been implemented in order to increase efficiency on our production floor and on our customers'.

Farmington has a long history of production, but it didn't always produce machines, correct?

That's right. We actually began manufacturing on a small scale with the production of punching tools in 1974. It wasn't until a few years later in 1977 that we began producing machines. The first models built were the TRUMATIC 150 W punching machine and a year later the TRUMATIC 180 punching machine models were added to the production portfolio. In 1979 the TRUMPF group entered the world of laser technology and in 1980 we added our first punch laser machine to our production line - a TRUMATIC 180 LASERPRESS. Five years later we celebrated the shipment of our 500th machine- the TRUMATIC 240 which was a high speed, high performance CNC punching machine. We continued on to design and produce TRUMPF's first purely American flatbed laser cutting center, the TRUMATIC 2503 LaserCat in 1991 and also recognized the shipment of our 1,000th machine in 1992 - the TRUMATIC 260 T. Later on, we would continue to produce the machine models such as the TRUMATIC 2020 Rotation, the TRUMATIC L 2530, the TruLaser 2030 and the TruLaser 1030 as well as fiber laser machines.

Are any of those models still being produced today?

Today in Farmington we are producing 7 different machine models: the TruLaser 1030 and 1040 fiber, the TruLaser 2030 fiber, the TruLaser 3030 and 3040 fiber, and the TruLaser 5030 and 5040 fiber. We also produce the 6m TruLaser 3060 fiber.

What makes building the current models possible?

For starters we have a very dedicated workforce here in Farmington. Whether it is our crew working directly on the line or our team in quality assurance, they put their best foot forward every day when it comes to producing these machines. From a structure standpoint, we have implemented a mixed-model flowline within production. With this model we have the flexibility and versatility to make the different models all within the same line. With a takt time of one day, each machine is built on platform carts that move down the US train rails installed in our production building from step 1 all the way to step 10. Steps 1 through 4 are where the actual building of the machine takes place and steps 5 through 8 are where machine start-up such as dialing it in, verifying functions, quality measurements and verifying cut quality takes place. Step 9 is final machine inspection by the quality department and step 10 is packing the machine and shipping it out.

You mentioned quality assurance, could you elaborate on the role it plays within production?

Our quality assurance team provides attention to every single step within the production process to ensure we are providing the optimal level of quality to our customers. It is vital that they have an eye on things in order to avoid any potential delays during production or delivery. In the event that there is a problem on the line, the production team implemented and improved our quality assurance escalation system just a couple of years ago. Since then, we continue to use an Andon principle approach. What this means is that as soon as there's a problem on the line, the employees hit a button that triggers a phone call for support in real time. If that phone call does not receive a response, the call then gets escalated to the next person and so on. This ensures that corrective measures are taken immediately so that the line is not delayed for longer than it needs to be.



↓ 45%

reduction in the time a sales order is required



↓ 70%

reduction in time needed for machine modification requests

“I am proud to say we have **seen tremendous progress** when it comes to our freeze points **during the production process.**”



The Farmington, CT production team poses near final machine inspection.



TRUMPF Start-up Technician, Ron, powers up the machine and loads software during step 5 of the production process.

Wow, it seems like these changes were very customer driven! Is there anything else that has changed in production over the years?

Yes, this was definitely customer driven. Our main goal is to produce their machines for them as quickly and efficiently as possible so that in-turn they can meet demand and begin producing parts for their customers as quickly as possible. Apart from that, we have also gone paperless on the production floor. In the past, each machine moved down the line with multiple pieces of paper. Today, each machine essentially produces only one piece of paper for the machine's life cycle in production. The paper includes individual barcodes that are scanned at each step which then registers where the machine is in the production process. Going paperless has eliminated the possibility for error and confusion along the way.

That's great. Over the years, what has been your favorite thing about overseeing production in Farmington?

For me it has been our dedicated team. Their willingness to adapt to change and face new challenges has allowed for the continuous development of the production department as a whole.

In addition to the advancements made to the escalation system, has there been any other areas where significant progress has been made?

I am proud to say we have seen tremendous progress when it comes to our freeze points during the production process. We have not only seen a 45% reduction in the time a sales order is required but we have also reduced the amount of time a customer could provide machine modification requests prior to the start of production by 70%!

Very impressive! What are key changes your team has made along the way to achieve those low freeze points?

We completely reengineered our process starting with the customer. In order to make modifications specific to what the customer wants at the latest point in time possible, we knew we needed to make specific components more readily available here in the US. To do so, we restructured our logistics process so that we now have a centralized warehouse where deliveries, specific to the customer configuration, are made to the production line twice a day. We also worked intensively with our suppliers to get customized material deliveries to the machines and were able to cut down on the overall material handling.

Prior to this we worked closely with our plant in Switzerland and had to let them know exactly what configuration of parts were needed, for example, motion units. The main problem with this was that the final configuration was needed very early in the process and it gave the customer very little flexibility to make changes to their order. We continue to order components from Switzerland but because we were able to implement a customer neutral supply chain, we now have the individual components readily available here in Farmington. This gives us much more flexibility to make those modifications ourselves during the production process, reducing the customers wait time for their machine.

“Our main goal is to produce machines as **quickly and efficiently as possible**”



LASER WELDING ADVANCEMENTS

Laser welding has been a hot topic in metal manufacturing circles for a long time, decades in fact. In the past, the discussion focused mainly on high volume products where the obvious advantages of using the laser as the welding tool such as high productivity, flexible weld seam geometry, reduced heat-input to the workpiece, etc., justified the higher investment compared to conventional arc-welding welding processes. Today, the discussion also includes low-volume products.

From those early days, TRUMPF has been developing the laser sources, optics, integration systems and software needed to enable laser welding as a manufacturing process. Throughout the history of the laser welding process as an industrial tool, TRUMPF has worked to make the process more cost efficient not just from an investment and operational cost standpoint, but from every angle.

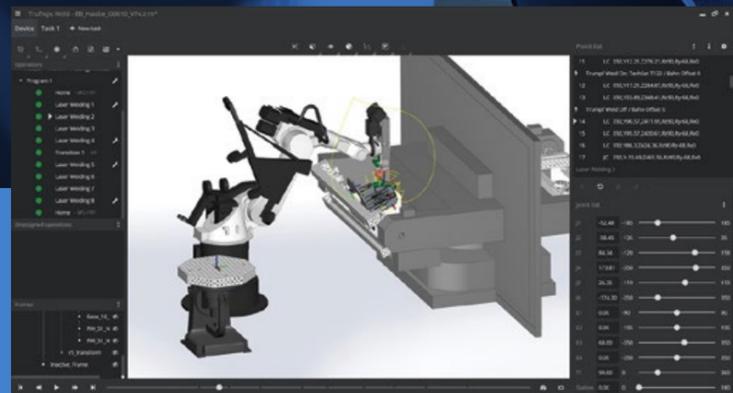
The introduction of thin-disk style YAG crystals have made the laser source insensitive to reflections from the workpiece, resulting in a more rugged tool for heavy industrial use. The development of diode-laser pumping technology made generating a laser beam more reliable and energy efficient. The development of the BrightLine fiber multi-mode beam delivery system allowed beam mode-shaping to occur right from the laser source instead of inside the processing optics, which in turn makes the laser as a machine tool both flexible and stable in production. And the steady pace of advancement has not stopped there: Laser welding technology from TRUMPF continues to evolve making it a more attractive solution for low-volume, high-variation sheet metal fabrication.

Impressive Programming

An area of particular interest for those who need laser welding to be a highly flexible tool is programming. The classic picture of industrial robotic welding being slow to setup, comes primarily from two considerations: Fixturing and programming. For a typical industrial robot welding an assembly, the programming process consists of manual teaching. This means a person with a control device moves the actual robot doing the work through all the physical motions required to weld the assembly, one step at a time. Welding a moderately complex assembly, like an enclosure box, could involve a hundred small, discrete steps that need to be taught to the robot, one by one. Any planning or adjustment the programmer decides to make must be made during the process of manually teaching the robot; any mistake that might be made on one of those many steps will also need manual correction. All of this happens while the robot is unproductive and not adding any value. Needless to say, it's an unattractive picture for the user that needs to get new assemblies into production often and rapidly.

FusionLine is based on a cleverly devised combination of the laser, beam guidance, optics and welding wire supply.

“TruTops Weld offline programming allows the programmer preparing the welding job to import a **3D model** for the fixture design”



Enter one of the stars of modern laser welding: TruTops Weld offline programming software. Good offline software allows the entire process of teaching new assemblies to the welding robot to be moved off of the factory floor. The welding strategy and all robotic motions can be simulated and verified without creating non-productive time at the equipment; In consequence, robotic welding programs can be available at the same time that the new assemblies physically arrive at the robotic cell for welding. Being able to simulate the process has the added benefit that potential issues show up, and can be resolved, well before the job hits the factory floor. Simulations also help to prevent costly mistakes: Instead of having to picture how a robot will interpret a set of waypoints, and perhaps not realizing the movements will cause a collision between the robot and the workpiece, the programmer can see with high precision exactly how the robot and workpiece will move in between each step and where any collisions might occur.

Tackling Fixtures

The other big hurdle to setting up production on a robotic laser-welding system rapidly is the fixturing method. Because, for the most part, laser-welding is not intended to use a filler material to weld over gaps in assembly, products that take advantage of laser welding must be designed with fit-up of the weld seam in mind. Aside from having the right sheet metal design in the first place, it is also necessary to have a good fixturing method that makes it easy for the person tending the welder to repeatably

locate the parts to be welded, as well as making it easy for the robot to weld consistently flawless seams. Clever design of sheet metal parts can make this process easier: For example, it is possible to achieve “fixtureless weldments” when the components to be welded are designed to lock into place and are self-supporting prior to welding. It is also possible to use “fixtureless welding” features on the sheet metal parts to make the fixturing less complex, even if it cannot be eliminated completely. Such designs will not always be feasible though, either due to end-product considerations or just due to the nature of the weld seams required. At that point, there are strategies to reduce the cost and lead-time for new fixtures, and offline programming can also be useful for this.

Because most end-users of this technology will be fabricators, construction of welding fixtures out of sheet metal will generally be more cost-effective than using machined parts or structural materials like extrusion. Using fixtureless welding sheet metal design techniques - like keyed slot-and-tab edges - allows the manufacturing cost and time for the fixture to be reduced: The required pieces can be cut with a laser or punching machine, rapidly assembled and tack-welded to produce a fixture ready for production. TruTops offline programming allows the programmer preparing the welding job to import the 3D model for the fixture design, match it up to the welding assembly, and simulate the process to ensure the fixture will work before it is fabricated.

Further Advancement

We have also developed additional technologies that further reduces pain-points for laser welding operators. As mentioned earlier, laser welding is not intended to use a filler wire - however we recognize that laser-welding is constantly evolving. With that in mind, we advanced our laser welding capabilities a step further by developing a technology that could in fact use filler wire to close a gap. FusionLine enables users to add wire to their weld seam and bridge a gap up to 1 mm (0.04 inch) eliminating the need for companies to optimize their parts portfolio when it comes to laser welding. This process also helps to strengthen the welds in structural parts, allows operators to process more components and increases overall utilization rate.

In addition to our offline programming, our TeachLine sensor system also reduces the time and effort required for retooling. It detects when the actual position differs from the required position and automatically corrects the program. The second line laser enables you to take measurements independently of the direction. An important piece to this technology is the optimized visualization of the welding process, which means operators can check their seam in parallel to welding reducing downtime on the machine and freeing up the operator for more value added processes.

Finding its Place

These and other enabling technologies developed, and under development by TRUMPF, are constantly reducing the cost and time required to utilize laser welding. Consequently, even small-batch production can now realize cost savings through the high productivity and quality of laser welded seams. In many cases laser welding even continues to eliminate or greatly reduce other non-value-added processes such as grinding, polishing, straightening, seam preparation, passivation and more. Based on the inherent advantages of the laser-welding process and the increasing accessibility of the technology, it seems likely that in the not-too-distant-future the robotic laser-welding system will be a common-place feature of metal fabrication shops, large and small.



Laser welded terminal boxes
(from bottom to top): mild steel,
stainless steel, aluminum

WeldGuide: The online platform for laser welding

TRUMPF's new WeldGuide offers exclusive tips on laser welding and provides users with:

- Technology knowledge, techniques and methods in a database
- Practical example parts
- Fixture models from practice
- Download components and fixtures as CAD Models
- Configuration of your TruLaser Weld systems
- Free access - simply log in to MyTRUMPF portal



Visit www.weldguide.trumpf.com
or scan the QR code to get started!





Interesting. Worthwhile. Surprising.



Automated arc welding

TRUMPF has released its first automated arc welding system that makes adopting automated welding easier than ever. The TruArc Weld 1000 comes with a collaborative robot known as a “cobot” that assists in the creation of the program, rather than relying on values from an offline source or entering positioning data into a control. After the operator manually guides the cobot over a part, it automatically creates the weld program. The remarkably easy programming enables fabricators to utilize robotic welding, even with a lot size of one. CE-compliant and approved by TÜV Austria, the TruArc Weld 1000 meets the very highest safety standards.



A productive combination

The new TruMatic 3000 fiber is the first combined punch-laser machine from TRUMPF to feature a control panel with a Touchpoint interface, making tool management easier than ever before. This machine also pairs a “flying” delta-drive punching head featuring all-tool rotation with a 3-kilowatt TruDisk laser. Together they perform an unparalleled range of processes from punching and forming to tapping and laser cutting, reducing handling and eliminating secondary operations. The TruMatic 3000 fiber with a working area of 60”x120” can also be equipped with TRUMPF automation such as the SheetMaster Compact which offers the ability to load and unload full sheets.



Clean bending of parts

Bending visible parts without leaving marks is a real challenge - especially when it comes to painted, coated or high-gloss surfaces and film-coated sheets. The new RollBend RBK plastic bending tool enables mark-free bending even with variable material thicknesses and in combination with bending film. The tool can create short side lengths as well as recesses and holes close to the bending line, all without causing deformation. The RollBend RBK can also be used in combination with the standard RollBend tool. The tool is specially designed to enable rapid, toolless replacement of the jaws at a reasonable cost.



Smart material flow cuts costs

TruConnect intralogistics solutions from TRUMPF make the transportation of materials through the production chain more efficient. They include hardware, software and services to help companies digitally model the flow of materials and make targeted improvements. This allows them to increase capacity utilization while simultaneously reducing costs. By creating a digital twin of their production environment, they can systematically plan and control the entire manufacturing process. Logistics staff and production planners benefit from greater transparency on the shop floor, making it easier to identify inefficiencies. It also allows workers to spend their time on value-added activities instead of materials handling and administrative tasks.



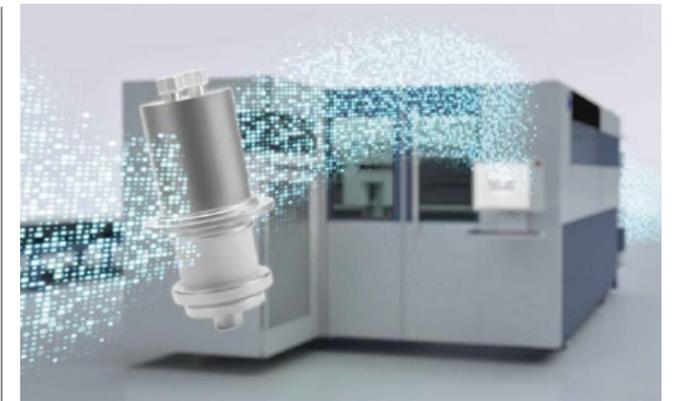
Introducing @trumpf_inc

TRUMPF has ventured onto TikTok, a popular social media platform where users can upload videos that are 15, 30, or 60 seconds long. The rapidly growing platform provides the opportunity to reach a younger demographic through lighthearted, fun, and engaging videos that highlight life at TRUMPF and our role in the manufacturing industry. By demonstrating different aspects of the industry, our goal is to spark viewers' interest in manufacturing by providing a glimpse of what we do, how we do it, and why we take pride in our company and our work.



New training courses available

As of July 1st, TRUMPF has introduced its new training catalog. This year, new course offerings are available both in-person and online at our training locations in Farmington, CT, Hoffman Estates, IL, and Costa Mesa, CA. New material includes our SheetMetal Design course which has been created for engineers, designers, and programmers involved in the designing of their sheet metal parts. Here, individuals will learn how to streamline the design process and how to make full use of their sheet metal knowledge to design even better parts in a faster and more cost-efficient manner.



TRUMPF's Smart Power Tube

TRUMPF is expanding its data-based condition services and has introduced the Smart Power Tube. The Power Tube is crucial for almost every CO₂ laser machine. Via its Smart counterpart, TRUMPF is able to monitor the life-cycle of the power tube and provide a replacement tube before it fails. This allows customers to avoid unplanned downtime and increases their transparency on the performance of key components of their machine.

Those data-based services are made possible by connecting machines to TRUMPF's Condition Monitoring Portal. Customers will benefit from data driven diagnostics to better analyze historical machine error data, identify errors quicker and offer faster, more sustainable problem solving strategies. Additional benefits are the Condition Reports that are available through the customer portal MyTRUMPF for all TruLaser 1000-5000 machines, all TruBend 5000 and 7000 machines and for some TruMatic machines. These reports provide detailed production data, machine status, and consumption and collision reports, allowing organizations to improve the operation and maintenance of their equipment. Prerequisite for the services is a free of charge Transparency Agreement.

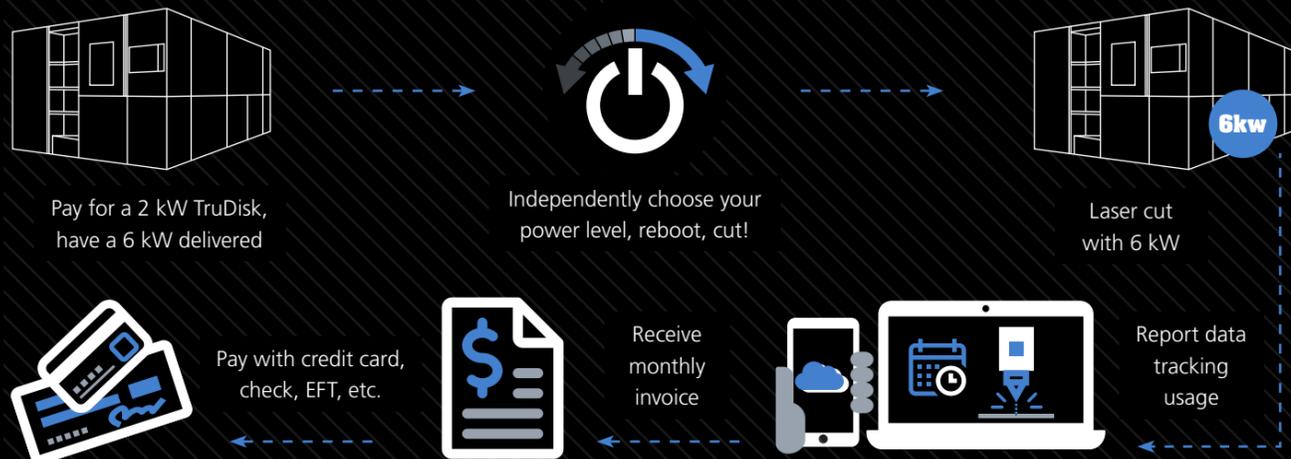
Aha!

POWER BY THE HOUR

With TRUMPF's Power by the Hour program, a machine may be purchased at the investment level of a lower power rating – but still have on-demand access to the increased power level at any time for a per-hour charge.



Take advantage of up to 6 kW of laser power at the investment cost of 2 kW on our TruLaser series 1000.



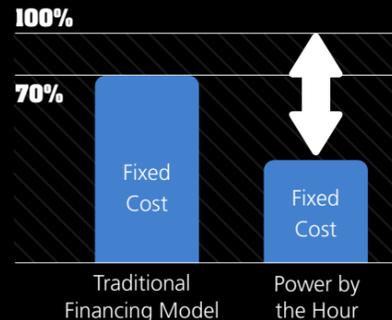
*hourly usage is based on Laser Beam on time

Increase production with higher laser power



- 30% lower fixed monthly costs**
- Higher performance and material capacity when you need it
- Pay for what you use
- Boost productivity by up to 70%
- Freely switch between 2 to 6 kW during production
- Flexibility to buy full power at any time

Take advantage of lower monthly machine costs** with TRUMPF's Variable Power Usage model.



*Power by the Hour is also available on our TruLaser series 3000 with up to 10 kW of laser power at the investment cost of a 6 kW machine.** when financing a machine

pARTgallery



This picture shows a **die for an ejector tool** in a completely new light. The tool is used to sort parts in combination punch-laser machines. Using a series of targeted strokes, it removes laser-cut finished parts from the metal sheet and sorts them into "good" or "scrap" bins. Photographer **Jan Kornstaedt** has taken this tool out of its familiar environment and given it a whole new context.

PROGRESSES

I am reading a book by Jesse Norman, a member of the British Parliament, that confirms my faith in individual liberty, the right to own property and the due process of law as the greatest instruments for human progress. The book is about Edmund Burke who was born in Dublin, Ireland in 1730. Burke was a principled politician always insisting on personal accountability and avoiding the temptation to use his public office for personal enrichment. He possessed an amazing and practical intellect which he put to great use helping to shape the social policy of his day as well as ours.

At the age of twenty, Burke moved to London to be at the center of the action for at the time London was the "metropolis for a trading empire stretching from Barbados and Boston to Bengal. It was a financial centre that supplied capital and liquidity at low interest rates to Britain's fast-growing entrepreneurial, industrial and commercial classes. It was a crucible of new ideas, and political controversy fueled by newspaper and pamphlet wars. It was celebrated on the continent as the home of the liberty of the individual, the land of the theater and the pub, a place where monarchical authority had been made subject to law and free thinkers could dissent without the endless fear of reprisal." Burke had to be there to shape a brighter future for humanity - and that is just what he did.

Burke was an early advocate for the American colonies and insisting that their local circumstances be heard and not be ignored. He was skeptical of monarchies and their insidious royal patronage and wrote extensively about the need for constitutional restraint on executive power. He also opposed slavery which helped fuel the abolitionist movement and fought for more equal treatment of Catholics in his native home of Ireland. He also was vehemently opposed to the French revolution which seemed to contradict his devotion to liberty but on closer scrutiny did not. For Burke, the path to a citizen's better life was through representative self-government, the rule of law and acceptance of properly functioning political parties and a willingness to surrender power to principle.

-Burke Doar

PARTNERSHIP



TRUe #07

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