

TRUMPF

MAGAZINE FOR SHEET METAL PROCESSING IN NORTH AMERICA

1/17

Express

THINKING BIG:

Large format laser cutting in Mexico

HOMECOMING:

Carey Manufacturing competes with its world-class precision

HUNGRY FOR MORE:

Heat and Control grows with efficient manufacturing



BURNING HOT

Sherwood fans the fire with precision fabrication



Express 1/17

4 *TO THE POINT*

6 *PANORAMA*

12 *SMOOTH RIDE*

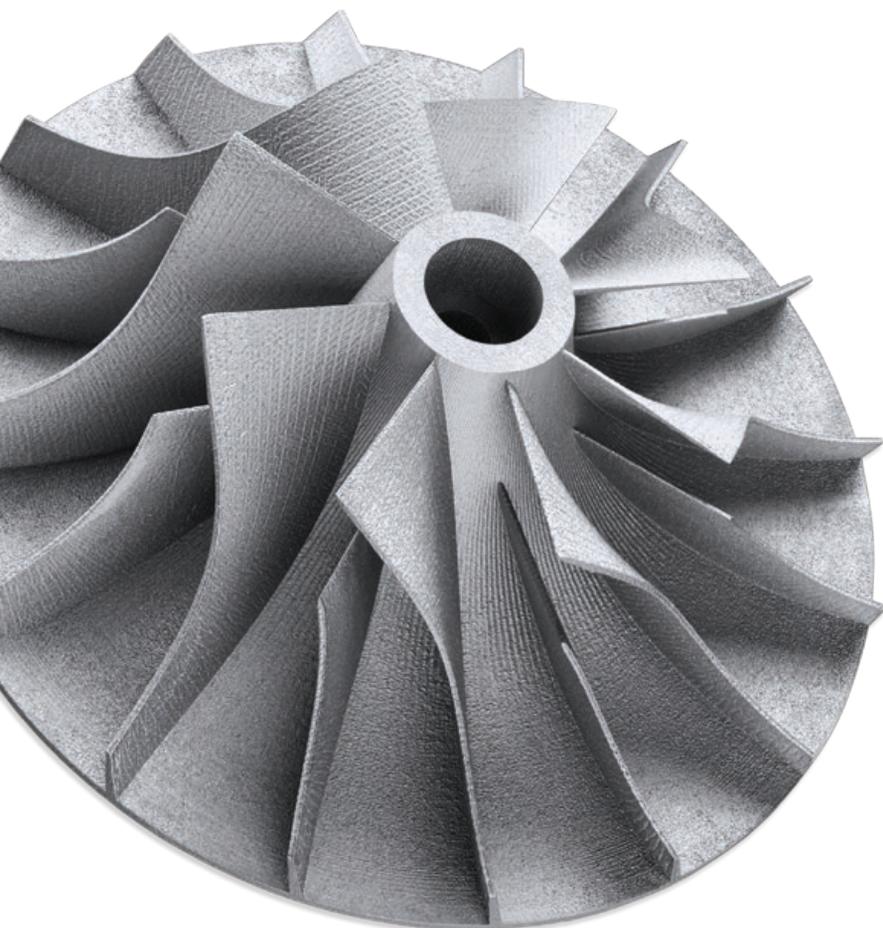
21 *MASTERS OF SHEET METAL*

32 *PERSPECTIVES*



14 *LARGER THAN LIFE*

Inoxidables de San Luis provides for its customers, including large format laser cutting with its new TruLaser 8000.



*Additive manufacturing
and the solutions only
TRUMPF can offer.*

READ MORE ABOUT IT ON PAGE 17



22 *LATCHING ON TO CONNECTICUT*

With the right equipment, Carey Manufacturing found success in bringing manufacturing back home.



26 *FEEDING THE INDUSTRY*

As a pioneer in food processing and related equipment, Heat and Control serves customers with far more than just great products.



30 *REDISCOVERING METALWORK*

With the help of Executive Director, Carissa Hussong, the preservation of metal continues to shine at The Metal Museum.

8 *WARMING WAYS*

Sherwood Industries has fired up its business with a thorough transformation to new technology.





Face competition with
confidence and openness

Free trade is a topic which can cause great anxiety these days. Whether you engage in the commentary or prefer to avoid it, as manufacturers, global trade is an issue that greatly affects us. The objectives of the North American Free Trade Agreement (NAFTA) were lofty when it came into effect more than two decades ago. It created one of the world's largest free trade zones with a total market of 484 million consumers. The U.S. now conducts more than \$3.6 billion in trade with its North American neighbors each day, and has improved living standards in all three countries.

One of the consequences of NAFTA was increased competition; more companies with different sources of competitive advantage vying for market share. Some competitors have access to higher skilled labor, others to lower labor costs, some benefit from cheaper natural resources, and others with proximity to important customers. Of course, with competition comes change, and much more has to be done to retrain and grow employees impacted by an open economy. It goes without saying that we believe in fair competition, where we all play by the same rules and the playing field is level. But, competition is not to be feared. It should be embraced because it is one of the key forces driving us to be better. Protectionism is a detriment to consumers as well as manufacturers.

In sports, it is no coincidence that top teams tend to play in the most competitive league. The same mindset should be applied to international trade. Each company must find ways to leverage their strengths to improve their competitive position within an increasingly global market. For some this means outsourcing some segments of their production process in order to focus on core competences. For others it may mean insourcing a key process to increase flexibility and reduce lead times, as was the case for Carey Manufacturing, a Connecticut company highlighted in this issue of TRUMPF Express.

At TRUMPF, we stand ready to help you leverage your strengths and create new ones. We see many more opportunities for our customers in economies which are open rather than closed.



A handwritten signature in black ink that reads "Peter Hoecklin". The signature is fluid and cursive, with the first name and last name clearly distinguishable.

Peter Hoecklin,
President and CEO

PANORAMA

Engineers graduating from post-secondary education in Mexico annually.

115,000

Over the last ten years, TRUMPF Mexico has made a tremendous impact in TRUMPF's success in North America.



CELEBRATING A DECADE

This year TRUMPF Mexico celebrates its 10th anniversary in Monterrey, Mexico. The 68,000 square foot facility for sales, service, machine demonstrations, and production opened its doors in March of 2007. Over the last ten years, the facility has made a tremendous impact in TRUMPF's success in North America. With customer convenience in mind, TRUMPF Mexico also has a team of trained engineers to provide local support. "I have witnessed the growth of TRUMPF Mexico since the idea

of having a manufacturing location was first discussed," says Jorge Areyzaga, managing director of TRUMPF Mexico. What started with only twenty-four employees has since nearly tripled due to the strong growth of our production capabilities. The first machine frame that was welded, shot-blasted, painted and shipped for machining and final assembly in Farmington, CT was a TruPunch 2020. Now there are five frames and pallet changers used only for the assembly of automation

components. "The technology of TRUMPF never ceases to amaze me. I'm proud to belong to this company," explains Miguel Cerda, field service engineer of TRUMPF Mexico. The hard work and dedication of TRUMPF Mexico's employees help the facility thrive towards company growth and development. "Being able to work with the Mexican TRUMPF team is such an enriching experience," says Areyzaga. "I am confident we will continue to work together as a team to overcome any challenges."



MADE IN MEXICO

7th

Mexico ranks as the seventh largest automotive producer in the world.

\$590 billion

In 2014, Mexico exceeded \$590 billion in two-way trade in goods and services (Forbes, 2014).

33%

Manufacturing's contribution to Mexico's overall economic output.

TRUMATIC 1000 FIBER

The new TruMatic 1000 fiber is the first entry-level punch laser combination machine from TRUMPF with a solid-state laser. The modular design concept allows the TruPunch 1000 to transition into the TruMatic 1000 fiber. The redesigned drive technology enables the patented Delta Drive to move both the electric punching head and the laser along the Y-axis while the sheet moves in the other direction. This drive system not only ensures a dynamic punching process and high productivity rate but also provides a

compact footprint. Both the TruPunch 1000 and TruMatic 1000 fiber have the ability to connect to the new SheetMaster Compact, an automation system designed to load small to medium sized sheets and blanks and unload microjoint sheets and scrap skeletons. Optimized loading cycles make it possible to complete most of these tasks while the machine is in operation. The TruMatic 1000 fiber is unmatched in the industry. Its innovation process is specifically designed to grow with a customer's business.



The modular design of the TruMatic 1000 fiber enables customers to grow its capabilities as business allows.



THREE CLICKS.

That's all it takes for you to find exactly the information you need with the new TRUMPF website. The new site offers personalized web content, specifically tailored to your individual needs. This is facilitated by a new location detection feature that automatically updates the information based on your specific country location. The website selects one of seventeen different languages and sets the correct translation for over four million words on the site. For enhanced viewing, the website's responsive design also adapts the layout to any device used to access the site. The "less is more" design approach will allow you to enjoy easy access, simplicity, and clarity while visiting: www.TRUMPF.com.

Fabrication Manager Shawn Swartz, StageRight

"The TruLaser Tube 7000's automated set-up and conveyor system enable us to handle high rates of material changeover. Our biggest limitation is getting material to the machine fast enough."



Peter Brix, Maintenance and Cutting Division Manager at Sherwood Industries.



Warming Ways

Sherwood Industries LTD. fuels its business with modern fabrication equipment

From its quiet location in Western Canada, Sherwood Industries, owned by Cherbel Yousief and Stuart O'Connor, has become one of the largest hearth product manufacturers in North America. It is a manufacturer of freestanding, fireplace inserts and fireplaces which come with three fuel options, wood, wood pellets and gas (propane or natural gas), all under the Enviro brand. Sales are through distributors that supply dealers and also provide feedback to help drive product development. All work is done in-house by nearly two hundred employees located in beautiful Victoria, BC on Vancouver Island in Canada. Being on an island can create some logistical challenges but Sherwood is fully content to remain a part of the community that has helped build its success.

For over 25 years, Sherwood has developed products that are not only highly efficient and attractive heat sources with unsurpassed quality and craftsmanship but also full of modern niceties. These include innovations such as the Proflame 2 system, electronic pilot ignition, flame control with modulation, fan control with modulation, dimmable light control, thermostat operation, split flow to operate multiple burners independently, and others. Keeping pace with modern times is the mindset of Peter Brix, Maintenance and Cutting Division Manager. When Brix joined the company seven years ago the shop was long overdue for new equipment. "I was originally brought on board to bring the maintenance division up to standard, and I was extremely busy just keeping machines running due to the age and wear and tear of the equipment." Something needed to be done to improve things so with the approval of Sherwood's owners, he started an initiative to upgrade the equipment piece by piece. With a background as an industrial mechanic, Peter started researching which machine to purchase first. "New machines would give us more capacity with less manpower and are faster, better and more reliable."





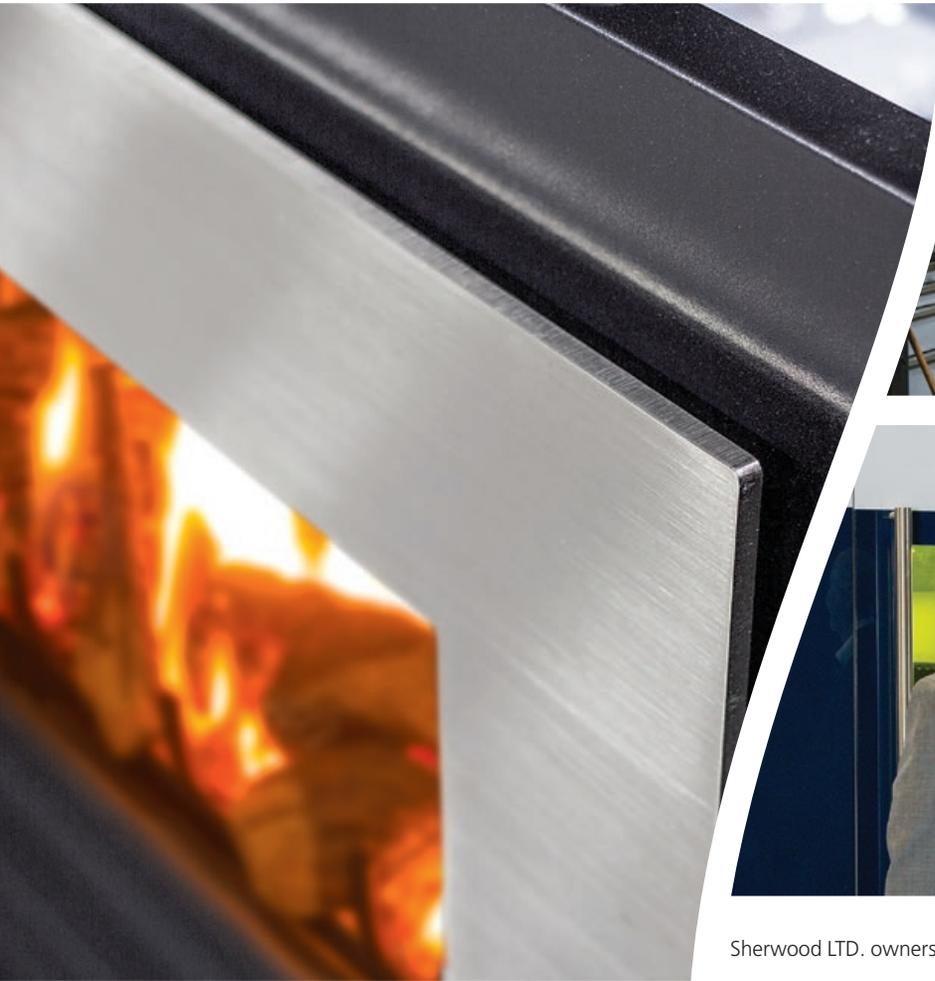
With the latest laser cutting equipment, Sherwood has expanded its cutting capabilities and lowered its manufacturing costs.

MODERNIZATION, STEP BY STEP

Brix approached each machine type with an open mind not ruling out any manufacturer. Favoritism to any name brand was out. Each machine type he was to purchase would need to be selected on its own merits. “While it is nice to deal with the same manufacturer, speed, production and precision was what I was after.” His experience as a mechanical/ electronics tech aided his meticulous research which covered every aspect of the new equipment. “From machine performance, investment costs, hardware technology to the software and maintenance – I stuck my nose in all of it,” he explains. It might seem extraneous to repeat the process for each offering and each manufacturer but Brix asserts, “In the end every machine won its spot on its own merit – and it just happened that every purchase went TRUMPF’s way.”

Modernization began with punching since time studies revealed this process was still the faster and cheaper way for Sherwood to process parts. “Even though the TRUMPF machine was a bigger initial expense since we also had to invest in new tooling, the payoff was substantial. Tooling changeover takes just minutes on the TRUMPF machine so we immediately regained 2-3 hours of production per shift that we had been losing on tool changes with the old machine. Above that, on our products, the TruPunch is 25-40% faster than the competition,” explains Brix who now maintains two full sets of tooling to facilitate even faster transition from thick to thin material. The rotating punching head also enabled Sherwood to increase productivity. “We punch all day long without having to change the punch tooling and that saves a lot of time. In addition, we don’t have nearly as much grinding as tool life is significantly longer,” he asserts.

With punching under control, Brix moved on to address Sherwood’s bending capabilities. Two servo-driven TruBend Series 7000 electric press brakes were chosen for their ability to process small parts very quickly and efficiently and a TruBend 5085 was selected to round out its forming capabilities. The company’s three new TRUMPF press brakes are now able to do the work of its eight old ones. Brix says the time savings from the quick release tooling alone made the machines worth the investment and other progressive features just added to it. “The safety features of the new systems keep our company moving in the right direction as far as operator safety and the enhanced graphics at the control HMI make it easy for operators to run through the bending sequence.” Brix explains this is especially important given Sherwood’s remote location. “Our old machines required an operator with a lot of experience to



Sherwood LTD. owners Stuart O'Connor (left) and Cherbel Yousief (right)

run but even inexperienced operators learn the new machines very quickly.”

Sherwood’s most recent step toward modernization was to replace its old CO₂ laser cutting machine with a new TruLaser 3030 fiber. “We knew any fiber laser would be faster and more efficient than our old CO₂ lasers but we determined TRUMPF had the better and more reliable product – and the software is incredible.” Brix says his machine operators especially appreciate the Drop&Cut feature which enables them to easily cut short runs or single parts from remainder sheets without the need of a programmer. With the new machine, Sherwood also significantly reduced its gas consumption by cutting with shop air. “A lot of companies don’t even know they can cut with shop air, but it works very well for us since edge oxidization is not a concern,” he explains. With the use of shop air, our gas consumption will be drastically reduced over

nitrogen cutting. We still use oxygen to cut steel plate – mostly 0.3125” or 0.25” – primarily used in the production of wood stoves.

HIGH-EFFICIENCY FABRICATION A wide range of product offerings keep Sherwood’s customers happy; and with modern machinery the company can better accommodate short run changes and on-demand production. “We have increased our flexibility in fabrication so we are able to run a more diversified part mix and still keep up,” explains Brix. “And the added capacity has allowed us to take on a bit of contract work as well.” This work can be planned around Sherwood’s busy season since hearth products tend to be manufactured from March to November for distribution and sales prior to winter. With so many exciting changes in place it would be easy to sit back and bask in the glow of modernization, but Brix still has his eyes set

on the future. Or as he simply says, “We’re not done yet!” □

➤ **PLEASE DIRECT YOUR QUESTIONS TO:**

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 Punch: Brian.Welz@us.trumpf.com
 Press brake: Tom.Bailey@us.trumpf.com

A MODERN VIEW

WHO: Sherwood Industries, Saanichton, BC, Canada. Founded 1989. www.sherwoodindustries.ca/

WHAT: Premier manufacturer of wood, gas and pellet fireplace inserts and freestanding stoves sold across North America.

HOW: TruPunch 5000, TruPunch 2020, 2 x TruBend 7036, TruBend 5085, TruLaser 3030 fiber

Driving Innovation

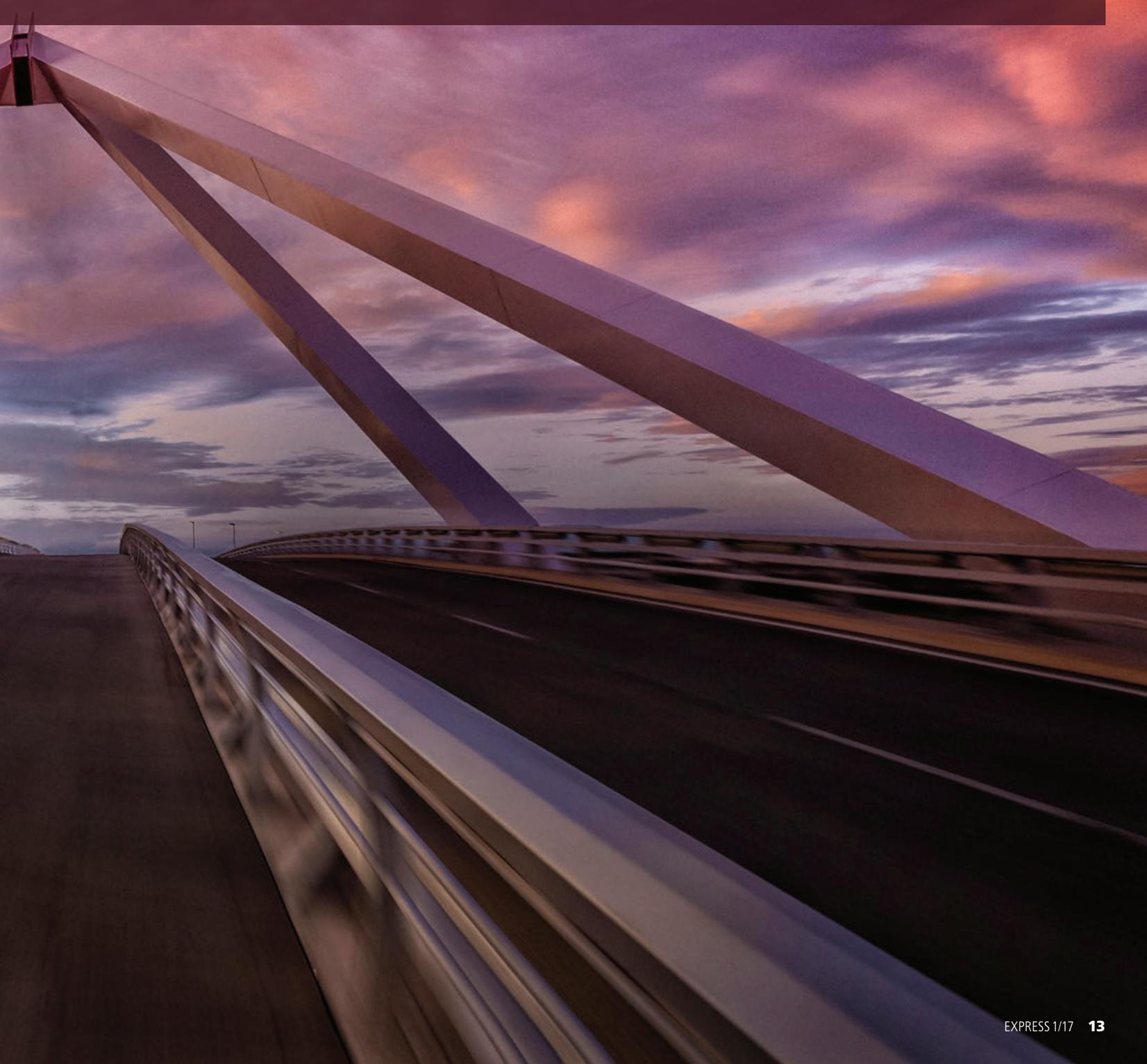
Tiffin Motorhomes delivers worry-free adventure

Since its inception in 1972, Tiffin Motorhomes has helped countless trailblazers navigate the open road. With 1,200 employees distributed across three locations, this family-owned and operated business manufactures approximately 2,800 motorized RVs a year. With both gas and diesel powered options, the Class A and Class C vehicles range from 25.25 to 45 feet in length. All are built to order with a ten to twelve week lead time for delivery throughout the United States. Tiffin's commitment to manufacturing a superior motorhome begins with the raw chassis and extends to everything around it. "We began building our PowerGlide®



chassis in 2007 which allowed us to control manufacturing from the tires up. This gives us a unique perspective and position in the marketplace,” explains General Manager Tim Tiffin. Sheet metal fabrication begins at one of the company’s two TruLaser 3030 fiber machines where parts are precisely laser cut for exterior storage compartment doors, interior frames, and the hundreds of brackets that comprise any coach. These parts are then formed by either a TruBend 3120 or a TruBend 7036 press brake. Since all of its customers are unique, Tiffin offers a wide variety of options to best suit the interests and travel aspirations of its passengers.

Tiffin’s Allegro Open Road gas-powered motorhomes make up its largest volume of work and tend to appeal to first time buyers. The company’s most loyal fan base gravitates toward one of its five models of diesel pushers. These larger and more powerful motorhomes not only feature a quieter ride but also a higher resale value. “By maintaining a focus on R&D, our engineers have created many clever products, and their abilities have only grown since our investment in TRUMPF machines,” explains Tiffin. With the next adventure always on the horizon, Tiffin has become a leader in the industry. □ www.tiffinmotorhomes.com



Larger than Life

Inoxidables de San Luis has become one of the largest stainless steel suppliers in Mexico under the leadership of Mr. Paulino Cavazos and his vision for excellence in metal fabrication. Last year, the company installed a TruLaser 8000 to enhance its capabilities and supply its customers with outstanding quality in oversized format processing. Here, Mr. Cavazos speaks about building a business and longstanding relationships with customers.



Mr. Paulino Cavazos has grown Inoxidables de San Luis into one of the largest stainless steel suppliers in Mexico.



Mr. Cavazos, can you tell us a bit about how your company got its start and how has it grown since?

Inoxidables de San Luis was founded in June 1991 with the main purpose of providing service, attention and assistance to stainless steel consumers in Mexico. We began our company with the main office in San Luis Potosi. We started in San Luis Potosi because it is a state that is geographically close to the main cities in Mexico. With the success obtained at our headquarters, we established offices in Tampico, Aguascalientes, Leon, Querétaro and México City, to offer closer service to a large number of our customers located in these states.

What is manufacturing like at Inoxidables de San Luis?

Our manufacturing is based on the needs of the customer. We have laser cutting machines and we can cut from thin gauges (0.019 inch) to very thick gauges (1 inch) we also have other machines like bending machines, punching machines and shears. This allows us to enter into all type of industries like automotive, chemical laboratories, kitchen

and food service, metalworking, cabinets for electrical circuits and others. In addition, Inoxidables de San Luis is ISO 9001: 2008 certified company which serves as a guarantee to our customers that we will provide them with quality services to their total satisfaction.

Was this desire for the customer's total satisfaction why you choose to invest in a large format machine, your TruLaser 8000?

Yes, we recognized the need for large format processing in our area and made the decision to buy the TruLaser 8000 from TRUMPF because it gives the advantage of laser cutting sheet metal parts up to 20 feet in length. The ability to fabricate parts of this size as a single piece ensures safe, fast and precise processing of the material and thus doubles our productivity. The machine is extremely accurate whether we are cutting thick or thin sheets and this quality is something our customers expect. We always make decisions to invest in new technologies with their needs in mind. And this is the only machine with these specifications throughout the center of the country.



Inoxidables de San Luis provides large format laser cutting with its new TruLaser 8000.

In addition to precision manufacturing, what other services do you provide customers?

Besides fabricated products, our company is a leader in all aspects of the stainless steel market. We sell stainless steel sheet and plates, diamond

plate, angles, round, square and flat bar, round, square and rectangular tubes, pipe tube and handrail tube fitting. With these offerings and our fabricated products we hope to give our customers everything they need in stainless steel as well as excellent service.

Your business leadership has become a reference for many other companies following your path in the metal fabrication industry. What is your approach?

At Inoxidables de San Luis, we are committed to continuous improvement within our own company, as well as performing with

professionalism to offer our products and services. We look to do this according to the needs of our customers and with the purpose

of achieving their satisfaction, thus ensuring a lasting business relationship. This is our goal. In this way we have been fortunate to grow our business alongside our customers who trust in us to support them.

Is this how you have been able to build Inoxidables de San Luis into one of the largest stainless steel suppliers in Mexico?

Our company is a leader in the stainless market because we have a very committed team, and because it is clear that the most important thing to us is offering excellent service to our customers. And, we have 25 years of experience and constant work in fulfilling and satisfying the needs of our customers. □

▶ **PLEASE DIRECT YOUR QUESTIONS TO:**
Laser: Mark.Bronski@us.trumpf.com

THINKING BIG

WHO: *Inoxidables de San Luis, San Luis, S.L.P., Mexico. Founded 1991. <http://inox-sanluis.com.mx>*

WHAT: *One of the largest stainless steel suppliers in Mexico and an expert in precision processing, including large format laser cutting.*

HOW: *TruLaser 8000*

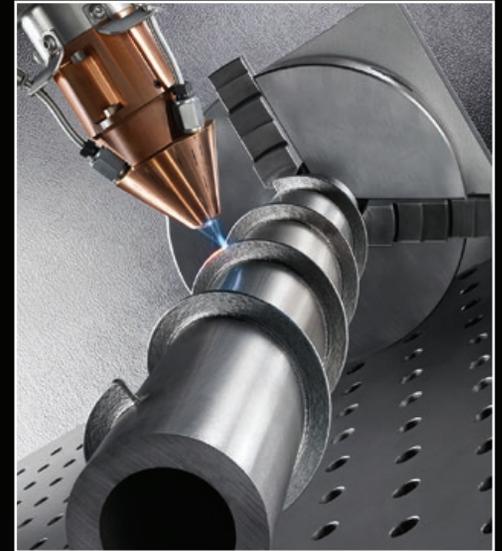
“The ability to fabricate parts of this size as a single piece ensures safe, fast and precise processing of the material and thus doubles our productivity.”

*Paulino Cavazos,
Inoxidables de San Luis*

SPECIAL

ADDITIVE MANUFACTURING

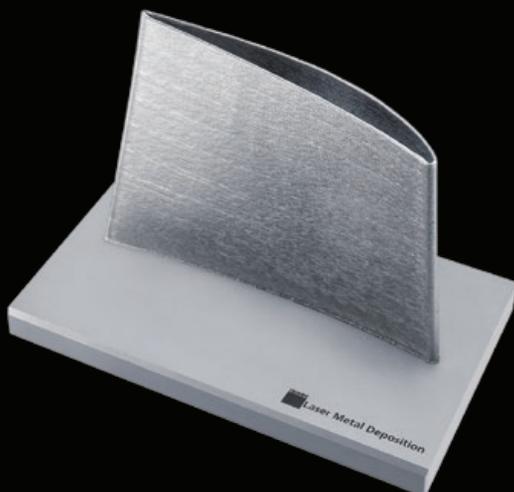
While other manufacturing processes alter forms through material removal (i.e. machining), a combination of force and heat (i.e. forging) or mechanical force (i.e. bending), in generative or additive manufacturing, structures are built up layer by layer. Laser metal fusion, electron beam melting and laser metal deposition are all types of additive manufacturing processes. Although there are several metal-based additive manufacturing methods, the most common and applicable to metal fabricators are the two powder-based laser additive processes: Laser Metal Deposition (LMD), also known as direct metal deposition, and Laser Metal Fusion (LMF). Both create a three-dimensional object from a digital model, but they do so through two very different processes.



Structure generation with Laser Metal Deposition (LMD) in a TruLaser Cell 3000 high performance five-axis laser system.

LASER METAL DEPOSITION

In Laser Metal Deposition (LMD), a laser beam generates a melt pool on the surface of the substrate. A stream of metal powder is then blown into that melt pool and fused to the substrate. The metallurgical bond created is significantly stronger than other coating or cladding methods, and it is typically applied to protect the part against corrosion or wear, for example, along the edge of cutting blades. Since structures can be generated from scratch or be applied to an existing structure, LMD can also be used to strategically reinforce parts.



APPLICATIONS

LMD is a highly versatile process that can add significant value to manufacturing and MRO based companies. These applications can be divided into four main types.

Cladding applications: One or more layers are deposited on an existing structure to generate an area with specific material characteristics. This might be used, for example, for coating valve seats or along the edge of cutting blades. In both applications, LMD supports the manufacturer in achieving increased wear resistance.

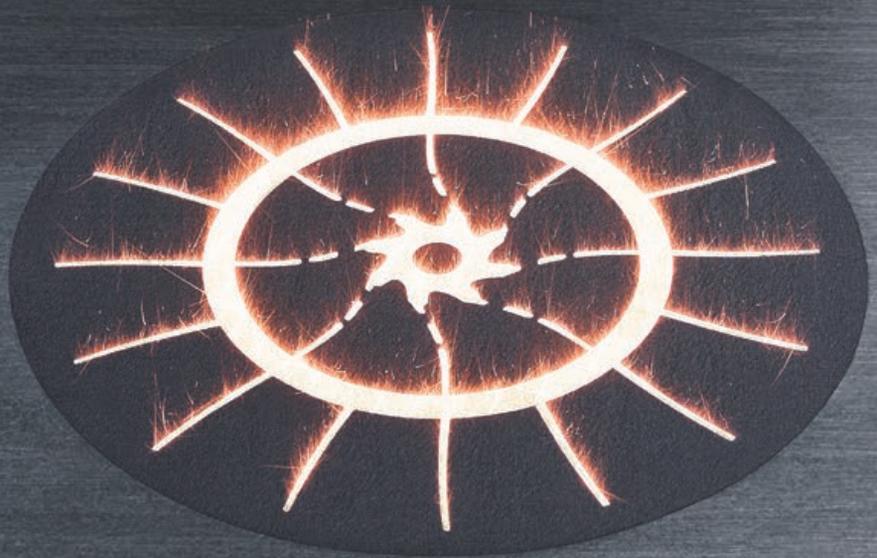
Repair: An area or structure that has become worn or damaged is first machined to a smooth surface then rebuilt through powder deposition. Turbine blades, shafts, commercial diesel engine parts such as pistons or cylinder heads, and forming dies are components that can be repaired with LMD.

Structure generation: This process enables buildup of structures that would have otherwise required the fabricator to machine the form out of a larger billet. Adding bosses or similar features to a tube is an example of this application.

Joining: LMD can be used to weld parts together. When the powder is used as additional material, it is also possible to complete more complex tasks such as joining dissimilar materials or bridging gaps which can be difficult with other processes, including laser welding.



Laser Metal Fusion (LMF) is ideal for medical applications like this hip cup printed in Ti6Al4V - ELI. The 3D mesh provides for bone ingrowth.



LASER METAL FUSION

Laser Metal Fusion (LMF) is most commonly referred to as 3D metal printing. A powder-bed based laser fusion process is used to build a part up, layer by layer. After a layer of metal powder is applied to a substrate plate, a laser beam fuses the cross section of the geometry to the plate. Following exposure, the plate is lowered and the next layer of powder is applied. The process repeats until the part is finished. With LMF it is possible to shape with flexibility and without the need for tooling. The technology is particularly interesting for generating lightweight designs, bionic structures and customized parts.



APPLICATIONS

LMF or 3D printing in metals has found its place in a number of industries. Since it enables designs and functions that previously were not possible, and it does so without the need for any special tooling, it has become a valuable manufacturing solution across many industries and applications.

Since the 3D printing process gives fabricators the ability to produce highly precise and complex shapes, it is the perfect tool for prototyping. The aerospace and automotive industries, for example, have implemented 3D metal printing to reduce development times.

In addition to prototyping parts, industries profit from 3D printing's unique ability to produce high volumes of one-off parts without tooling. The hollow, bionic structures that LMF is able to produce perfectly meet the key requirements of medical and dental applications. In addition, LMF has become the tool of choice for manufacturing lightweight components, such as aerospace brackets, cranial implants, or similar applications.

In the tool and die industry, especially for plastic injection molding, 3D printing enables fabricators to generate conformal cooling channels in the dies. These channels are impossible to fabricate otherwise and are used to improve cooling performance for significant cycle time reductions of over 30 percent.



TRUMPF Inc. applications lab in Plymouth, MI with LMD and LMF capabilities.

FREQUENTLY ASKED QUESTIONS

What personal safety equipment is recommended before a LMF powder-bed machine can be operated?

Although the safety requirements will vary based on local or regional regulations, TRUMPF recommends grounded shoes or heel straps, a full face respirator, a lab coat and gloves.

How can one determine if a part or component design is suitable for LMF?

There are a few indications that your design would be a good fit for LMF. If the design cannot be manufactured using conventional processes, if the printed part would grant increased functionality, for example, the ability to manufacture a complete assembly as a single part, or if turnaround time on the end product is so critical that it does not allow time to produce the tooling required by a conventional manufacturing process, the part is likely a good candidate.

How can I reduce the amount of post processing required in LMF?

The part's design has a significant impact on the post processing time required. It is therefore possible to reduce post processing by minimizing support structures. By avoiding horizontal surfaces, overhangs greater than forty-five degrees and horizontal drill holes greater than 0.236 inches, it is possible to greatly reduce support structures and post processing.

Is it possible to have a sample part printed using TRUMPF technology?

Once a suitable part is identified, TRUMPF can produce a sample at its Laser Technology Center in Plymouth, MI. The application laboratory is equipped with the latest TRUMPF technologies as well as a staff for application support and sales. Contact us at: oeminfo@us.trumpf.com

FAQ



The precise cut

By upgrading to the lightweight TruTool NIPN 200 nibbler, drywall expert Samuel Roth and his employees are now able to produce faster, more precise cuts on sheet metal's most difficult angles.

The owners of an Alpine Switzerland's five-star hotel accept no compromises when it comes to the hotel's quality and guests' comfort. The drywall partitions that divide the rooms and corridors are made of stable and rugged metal studs that need to be cut to exact dimensions- a task fit for a drywall specialist. When the opportunity was presented to Samuel Roth and his team, located in Igis, Switzerland, they gladly accepted the challenge. In order to complete this task Roth needed a reliable tool. He put his trust in the flexible TruTool N/PN 200 nibbler. "With its help, I can finish my work faster than with any other tool," Roth explains. The TruTool N 200 is well suited to cut flat and corrugated sheet metal whereas the TruTool PN 200 is a profile nibbler. The short tools of this nibbler are ideal for diagonal cuts in trapezoidal sheets and for cutting C-L-U profiles.

For the first few months Roth worked with drywall, he cut the material with hand shears. "From sore muscles to tendonitis, I had every kind of ache and pain," Roth recalls. With the lightweight TruTool series 200 nibblers, weighing just 4.8 lbs, he felt instant relief. He now uses these tools to comfortably complete many tasks at the worksite. For example, to set a bottom and top track, U-shape channels are screwed to the top floor and ceiling. The vertical C-profiles are then inserted between them and are spaced at 62.5 centimeters (24.6 inches) apart. This nibbler is extremely maneuverable and, thanks to its round punch, it can even turn on its own axis." Roth says. The tool was used for 750 U-channels and 3,500 C-profiles installed throughout nine stories in the hotel. Since ceiling heights vary, Roth needed to cut the C-profiles to match the length measured at each location. "The PN 200 is perfect for straight cuts on C and U profiles." Where notches or other rounded cuts are needed, the advantages of the TruTool N 200 are put to use. This tool was used to cut various openings in the U-channels and C-profiles to allow for the passage of pipes and cables.

Roth takes advantage of the flexibility of the new tools, since he regularly needs both the professional nibbler – the TruTool PN 200, and the standard TruTool N 200. The tools can also quickly be converted to other configurations without tools. These two tools have become Roth's most important tools in his toolbox.

(1) The TruTool N 200 excels in processing extremely small (0.160 inch minimum radius) areas. (2) Samuel Roth makes use of the versatility of the TruTool Series 200 nibblers. (3) On U or C sections, the TruTool N 200 nibbler cuts various notches and passages for pipes or cables. (4) Construction of Alpine Switzerland's five-star hotel.



Owner Jack Carey (left)
and Paul Lavoie of Carey
Manufacturing.

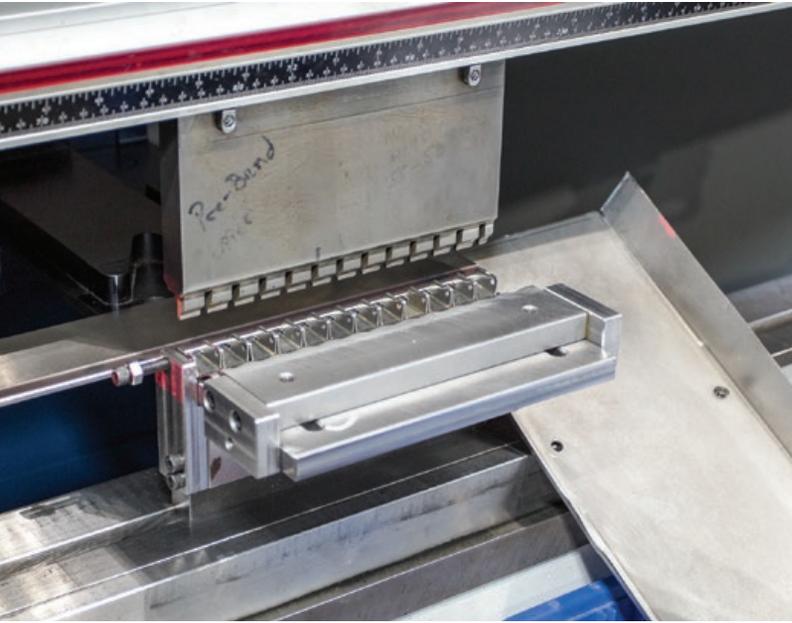
Latching on to Connecticut

Carey Manufacturing found it could bring its manufacturing back to Connecticut, be profitable, and best support customer demands by relying on the right equipment.

When Jack Carey established Carey Manufacturing he had just six hundred square feet to run his business. His company now fills a 30,000 square foot facility in Cromwell, Connecticut and offers nearly 800,000 types of catches, latches, handles, knobs and hardware for use in military, aerospace, computer, electronics, telecom, automotive, and consumer applications worldwide. Until recently, it made many of these products in China where manufacturing costs were just thirty percent of what they were in the United States. However, unpredictable quality led Carey to reconsider his approach and to invest in precision fabricating equipment from TRUMPF. “Our production costs are now very close to what China can offer - but we make the parts faster and better. We also benefit from the flexibility of the machines and what that enables for our business,” explains Jack Carey, President of Carey Manufacturing.

Despite the higher cost of engineering and capital equipment, Paul Lavoie, who manages Carey’s marketing and business development says, “Our improved customer service, greater efficiencies and other residual benefits have made us competitive across the globe.” Lavoie uses a recent example to illustrate this point. “Last Monday a customer called us with a problem. We manufactured samples and shipped them overnight so they were on the manufacturing floor the next day. We implemented a few tweaks and by Thursday we shipped the order. That process would have taken us several weeks if we still went overseas – and that customer would have bought elsewhere,” Lavoie asserts.





With innovative tooling, Carey uses its TruBend 5130 to efficiently manufacture even its smallest parts.

BUILDING CAPABILITIES Carey Manufacturing invested in a TRUMPF TruBend 5130 press brake several years ago, and recently acquired a TRUMPF TruLaser 1030 fiber and a TruMatic 7000 combination punch laser machine. “We offered some basic CNC machining at that point and a request came in that required more than we could offer in cutting. We reached out to TRUMPF and our sales rep, Lukas Baechler, came by that afternoon to

show us the options. That’s when the wheels started turning,” explains Carey. The combination machine was especially enticing for its overall flexibility. “Punching is our bread and butter, but the laser enables us to do things nobody else can do.” Carey estimates the TruMatic now processes 1,800 to 2,600 parts from a standard 4 x 8 foot sheet and it currently runs 24/7, even though the company has yet to transition all of its products to

the new machine. “We are able to fabricate almost all the forms and bends required for our products even though we are only in our infancy when it comes to tooling,” says Carey. “We have found ways to work around our limitations and we continue to learn as we go along.”

The TruBend 5130 also turned out to be an important tool as Carey worked to bring manufacturing back from China. “Many of our parts are small enough for the small electric press brake, but I wanted the larger machine so we would

always have the size and press force if we need it.” Since then the company has found innovative ways of using the equipment in support of its product designs, which include Winchester and USECO handles and knobs and Amatom hardware. Unique tools further enable the company to process several parts at once to increase efficiency.

The company currently manufactures three hundred of its part numbers in Connecticut and this continues to grow by the day. Stainless steel and mild steel parts were the first priority but many aluminum parts have been transitioned as well. Since Carey often adjusts its standard products to fit a customer’s application, its part numbers continue to grow as well. “The market has really changed over the past few years to a point where customers expect at least some tweaks to the design,” says Carey. “Luckily we can turn a project around in just a few weeks or less – and that includes all the engineering, design, tooling and testing. Once the hard work is done we can change parts over in about fifteen minutes. All of that came together with our new machinery,” says Carey.

OPERATIONAL EFFICIENCY Manufacturing in Connecticut has also benefited Carey Manufacturing from an operations standpoint. In the past the company typically sourced parts from China in quantities of 100,000, but since its customers order just 5,000 to 10,000 parts at a time there was waste in storage, transportation, and handling. “Parts in inventory are expensive to carry and every time you handle them it costs the company money. By keeping inventory to a minimum we can improve operations, cash flow and profitability,” explains Lavoie. These improved efficiencies are especially noticeable in Carey’s high transaction business. “We do \$8 million a year in sales from items like fasteners,

“Punching is our bread and butter, but the laser enables us to do things nobody else can do.”

*Jack Carey,
Carey Manufacturing*



catches and latches. Our purchase orders tend to be for less than a thousand dollars which means we process a substantial number each day and quick turnaround is the expectation – of any business today,” says Lavoie.

Carey has brought more manufacturing in-house while providing a quicker turnaround for its customers and has been able to do so profitably. The difficulty, according to Carey, is that foreign governments offer extensive subsidies which keep their manufacturing companies afloat and U.S. manufacturers struggling to compete. As a result, as Carey reveals, “Many consumers – including our military – think they are buying U.S. products without realizing their supplier has outsourced the manufacturing work while American hands barely touch the process.”

In the meantime, Carey Manufacturing has found a solution that works for its business. They are working hard to transition more products for production in Connecticut while also streamlining its sales and marketing efforts. In addition, the TruLaser 1030 fiber has opened up extra capacity for contract work which the company is looking to fill. “Most of our own

work is not strictly laser cut so we can easily cut flat patterns for those who either do not have the capabilities or who just prefer to focus on downstream processing,” Carey explains. He expects contract work will become a bigger focus in the future but at the moment, the company has so much work to do they need to figure out how to get it all done. But as both Carey and Lavoie agree, that is a great problem to have. □

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FLEXIBLE FABRICATION

WHO: Carey Manufacturing. Cromwell, CT. Founded 1981. www.careymfg.com

WHAT: Supplies catches, latches, and handles for military, aerospace, computer, electronics, telecom, automotive, and consumer applications and contract manufacturing.

HOW: TruMatic 7000, TruLaser 1030 fiber, TruBend 5130

Paul Lavoie credits improved efficiencies and quick turnaround with driving new business.





Director of Manufacturing Jessie Castillo (left) with Heat and Control President Tony Caridis and Randy Gruber (right)



Feeding the Industry

With a passion for R&D and continuous improvement, Heat and Control is a pioneer in food processing and related solutions.

In 1950, five engineers from San Francisco, California saw an opportunity to modernize and improve products for the food processing industry and formed Heat and Control, Inc. The founders channeled their passion for innovation to the transformation of food production from a manual process to a continuous one. The company's product portfolio expanded to include a wide variety of industrial processing and packaging solutions extended to food and non-food sectors. Innovation has been an ongoing quest for Andy Caridis, one of the original founders, who continues to lead the R&D efforts of Heat and Control processing equipment. Today, with the leadership of the company's President Tony Caridis, the company has a global customer base and long standing relationships that consist of large scale consumer and end-product manufacturers.

Heat and Control solutions focus on exacting quality, yield, efficiency and safety design principals and it has set high standards within the industry. These principals are carried through all aspects of the business, especially when it comes to its own operations, and has provided clear benchmarking for improvements in manufacturing capacity and workmanship. Tony Caridis comments, "In many instances I take personal responsibility for the success of our customer's projects and believe it's important that we continually push the boundaries to ensure we have achieved the best possible outcome. I saw many similarities in TRUMPF's approach to our project, and I'm extremely happy with the outcome."

Director of Manufacturing, Jessie Castillo, is a longstanding member of the Heat and Control team and considered part of the family. Following in his father's footsteps, Castillo joined the company at thirteen and has had many roles throughout his twenty-seven years. His background gives him an indispensable perspective of Heat and Control's transformation over the years. "The products we built fifty years ago look completely different from what they look like today and that has much to do with the equipment we have available in manufacturing. Technology

advanced and we've always kept up with the times to be as efficient as possible," he explains. Heat and Control's success is driven by its commitment to developing products that will help its customers improve their process, and to always improve within its own organization. For this reason it maintains very high standards and applies them across all its operations worldwide. Each location caters to the individual needs of the market it supports but works closely together to share knowledge, engineering and development.

Over time, the company expanded into different market segments and is now able to offer a turnkey solution to support whatever the customer or its layout requires. Although some customers buy a single piece of equipment, many of its projects are in support of greenfield plants. These customers especially appreciate the experience and expertise Heat and Control provides from the very beginning. Customers are also increasingly concerned with safety and hygiene as well as sustainability and efficiency and they rely on R&D engineers who pride themselves on designing elements that keep pace with changing standards across the industry, as well as the rules and restrictions put forth by the USDA, OSHA and others.

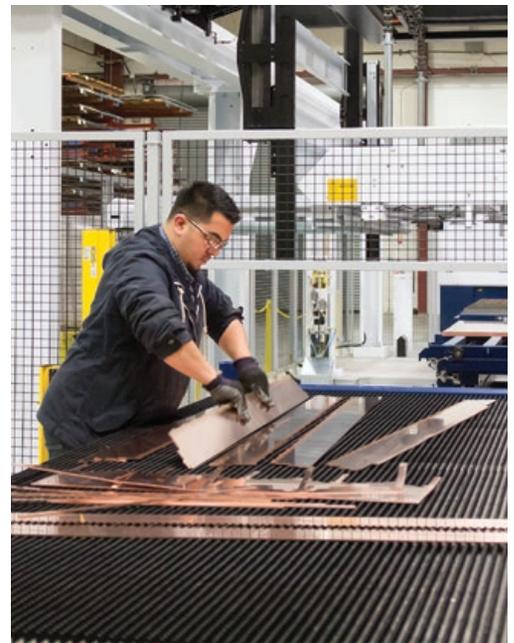
METAL MANIA Every Heat and Control product is custom-built and many are in production simultaneously. Since parts are rarely used more than once and even then, hardly in the same set-up, an overwhelming number of part numbers flow through the shop floor at any given time. Roughly eighty-five percent of its sheet metal fabrication is stainless steel and to achieve maximum sheet utilization, Heat and Control typically nests several jobs together. They rely on SAP, TruTops Fab and an assortment of other computer-based solutions to help keep everything in order but as Randy Gruber, Heat and Control's Manufacturing Engineering Manager explains, "Flexibility at the machine is crucial to our performance."

This is one reason Heat and Control was drawn to the TruLaser 3040 fiber with BrightLine fiber and RotoLas. "TRUMPF was the only manufacturer to offer a fiber laser machine with a tube feature," Gruber explains. "Other manufacturers talked about it, but TRUMPF had it, and that was a must for us." Tubes and pipes are used throughout Heat and Control's designs from distributing oil, water or steam, to structural supports, and headers on heat exchangers. With RotoLas, Heat and Control is able to switch between flat sheet and pipe cutting on-demand and three times faster than with its old system. The RotoLas function was just one selling point. "We did our research and no other company invests as much as TRUMPF in R&D and with the goal of developing something creative; and that became evident to us through BrightLine fiber," explains Gruber. "Fiber lasers cut thin material very fast, but TRUMPF wasn't satisfied with that. Their engineers stayed in R&D and came up with a way for it to cut with exceptional results across all thicknesses. Others followed suit with their own solutions, but that was a clear indicator TRUMPF is a leader - and we wanted that in a partner," he stresses.



"Flexibility at the machine is crucial to our performance."

*Randy Gruber,
Heat and Control*



One of the many custom built systems designed by Heat and Control.



Heat and Control was drawn to the TruLaser 3040 fiber with BrightLine fiber and RotoLas for its flexibility.

THE RECIPE FOR SUCCESS Material storage was not part of Heat and Control's initial intent with the purchase. "Our President Tony Caridis constantly challenges us with the question, 'Are we better today than we were yesterday?' and this drives us to consider how we might improve. Once we understood how the material storage would reduce our inefficiencies, and its return, we saw it made financial sense," explains Gruber. From there the company invested a lot of time – roughly ten months – to make certain they were happy with everything from the fit of the machines to the material flow of the shop. The flexibility to run full sheets or remnants at will was crucial and by replacing its manual storage racks, which were limited by the reach of its fork truck, they were able to extend storage vertically, to twenty-four feet. The company just needed to find a way to install each part of the system, which included a TruLaser 3040 fiber with LiftMaster Linear and a Stopa storage system with six towers, without interrupting its current production. "It was critical that we had the right workflow and that it all came together perfectly," Castillo says. "That took time but TRUMPF was always willing to work with us. They taught us about the options and were patient as we worked through countless layouts. We challenged them and they challenged us to get us where we are today - and we are very happy with the end result," he asserts.

In fact, Heat and Control is so happy with its TruLaser 3040 fiber in California that two additional machines are on order - one for a new plant in India and one for a factory that is currently under construction near St. Louis, Missouri. These two new locations will join the eleven manufacturing centers Heat and Control has established worldwide and will help to continue the company's legacy as an innovative pioneer. □

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PACKAGED FOR SUCCESS

WHO: *Heat and Control, Inc. Headquartered in Hayward, CA. Founded 1950. www.heatandcontrol.com*

WHAT: *A leading manufacturer, single and turn-key solution provider of food processing, seasoning and coating, conveying, packaging, weighing and inspection equipment*

HOW: *TruLaser 3040 fiber with BrightLine fiber, RotoLas, LiftMaster Linear and Stopa storage system*



"The people involved make me passionate about what I do because of the passion they have for metalworking."

Carissa Hussong

Rediscovering Metalwork

Unlike any other institution in the country, the Metal Museum, a small non-profit located in Memphis, TN, prides itself on exhibiting, creating and teaching the fine art of metalsmithing.

Carissa Hussong, Executive Director at the Metal Museum, grew up exposed to various forms of art- from her grandmother's collection of abstract expressionism to taking art classes as a child. During college, she found it hard to resist art history and studio art classes. Carissa then began an internship with the Seattle Art Museum. It was there she recognized not only her appreciation for fine arts, but the opportunity for a career in a field she loved.

"I moved to Memphis and started working at UrbanArt Commission where we worked on city projects and with public and private clients. The Metal Museum worked with my company at the time so I was able to meet the former Executive Director, James 'Wally' Wallace," explains Carissa. Wally, the museum's executive director for thirty years, began his career as a blacksmith artist. When he decided to retire, the community was worried the museum would not survive without his dynamic and unique leadership. "I wasn't quite sure what I was getting myself into, but I think Wally was aware of what I could bring to the museum and that it was in line with the type of change needed," she states. "I was able to bring administrative organization as well as creativity to the industry and take it to the next level," she recalls. Everything fell into place at the perfect time not only for Carissa but for the future of the museum.

The Metal Museum's primary focus is to represent metalwork through the lifespan of the museum, 1960s to the present day. "The '60s and '70s craft revival movement is really what sparked the institution. There was so much energy around the rediscovery of blacksmithing as craftsmen revived techniques that were lost during the Industrial Revolution," says Carissa. With the variations of metals on display, the museum aims to represent the field in its entirety. "Most of the artwork in our permanent collection stays at the museum- not always on display, but it is part of that treasure we hold for the public." Although the museum's focus is American fine metalwork, the museum has displayed metalwork from

artists around the world, most recently from Belgium, South Africa, Taiwan and Canada. "It gives the community a chance to see different metalwork from all over the world."

The work is made from a wide variety of metals including steel, copper, brass and others. Its rotating exhibits are typically on display for two to three months whereas work from its permanent collection is on view for a year to eighteen months. The artwork is donated to the museum by generous artists and collectors for either temporary or permanent display. "We tend to grow attached to the current temporary exhibit and sometimes we don't want to give it back," Carissa chuckles. Display is not an easy task. There are several barriers that interfere with this process including its weight, color, size and material composition. "Every exhibit has very different needs. I often times ask myself 'How can I represent the object in the best light?' Some of the metal we work with is very dark and difficult to light whereas some work has more color," explains Carissa. While displaying the artwork is important, the mounting of the object becomes almost more important. The mounts are constructed by one of the museum's craftsmen, Kevin Burge, who Carissa identifies as an invaluable resource at the museum. "I have a great sense of pride when I go to other institutions. I'm always looking at mounts and I pay a great deal of attention to their details. He (Kevin) does a great job and his mounts make a huge difference in the way the metal is shown and appreciated."

The museum thrives on passion through the people involved, the art produced, and the generosity of the community. "The people involved make me passionate about what I do because of the passion they have for metalworking. They are extremely talented artists who are also extremely humble. They have an appreciation for both the process and the product. This is what makes the metalworking community so special." www.metalmuseum.org

Tell us Ms. Hussong....

...What intrigues you most about metalworking as a form of art?

"We define metalworking as everything from jewelry to sculpture to architectural elements. The qualities that they all must share are that they are made by the artist/designer and that they are finely crafted. Obviously this encompasses a large amount of very diverse work. With every exhibition, I learn something new about the history of metalworking, about technique and about the artists themselves. Over the years I have developed tremendous respect for the talent, patience and vision required to create an object in metal."

...What are your future plans for the museum?

"Long term, I want to expand the museum. I would love for a new building to house new exhibitions and collections. We are limited in our current space because of the building's design. I would also love to expand the metalworking facility which would give us room to teach multiple classes simultaneously and to accommodate more students including our undergraduate interns, metalworking apprentices, artists in residence and community education. It would enable more opportunities for the museum's growth as well as individual growth."

...What is the apprenticeship program?

"With our apprentice and summer internship programs, we provide a unique opportunity for aspiring metalsmiths to hone their skills. Students gain experience in fabrication but also in working with clients and operating a business. They learn from our shop foreman and network with metalsmiths from around the country. Through these unique programs we aspire to develop and promote the next generation of metalworkers."



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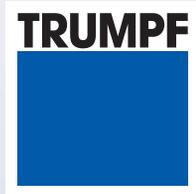
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