

THE OFFICIAL FABTECH PUBLICATION SHOW DAILY



TODAY'S EVENTS

Keynote: FABx Tech Talks 8:45 AM – 10:00 AM Thomas Murphy Ballroom

Panel Presentation: Innovate, Accelerate and Advance Manufacturing 12:30 PM – 1:30 PM Thomas Murphy Ballroom

Smart Manufacturing Hub During Show Hours Sessions All Day (see pg. 12) A/B Connector Booth AB2798

Knowledge Bar: Ask the Experts 11:00 AM – 4:00 PM Sessions All Day 3D/Additive Manufacturing Pavilion, Booth B6000

FABTECH Industry Night: Mercedes-Benz Stadium

6:30 PM – 8:30 PM Purchase Tickets in Registration

Spin to Win — Chance to Win Prizes! 12:00 PM – 5:00 PM Booth B9681

FABTECH Smart Manufacturing Hub Provides a Window into the Future

Fabricators and manufacturers could learn a lot from the example of Captain James T. Kirk of Star Trek fame. He embraced the new technology thrust into his hands to take mankind to the far reaches of the galaxy.



The mission of the Starship Enterprise, after all, was to boldly go where no man had ever dared to go before. The mission of the modern manufacturing enterprise could be stated in a similar vein those who wish to survive must boldly take their manufacturing practices, workflows, and assembly lines to places their forefathers never dreamed of.

For a sense of what's possible, all FABTECH attendees are urged to visit the Smart Manufacturing Hub on the show floor. It showcases some of the industry's most advanced smart technologies: automation, advanced materials, 3D printing, the Industrial Internet of Things (IIoT), 3D scanning, Virtual Reality (VR), Augmented Reality (AR), and more. Visitors can see

the technology in action, take part in hands-on demos, and attend technical presentations from industry-leading smart technology providers. This is the ideal way to rapidly get up to speed on the latest and greatest developments in this rapidly evolving field.

Unprecedented Innovation

We may not yet have realized all of the technological wonders portrayed in Star Trek such as teleportation,

warp drives, or phasers that could be set on stun. But the last decade has seen unprecedented change in the field of manufacturing. The IIoT, Big Data, the cloud, solid state drives, (SSDs), vast amounts of inexpensive processing power, virtualization, and digitization have unleashed a wave of innovation that has disrupted traditional practices. This has given rise to what is known as smart manufacturing, which is pushing the boundaries of productivity, efficiency, and speed to new heights. The growing need for education — along with a flood of new smart tools, robotics, and automation systems — drove the development of the Smart Manufacturing Hub. It brings together experts in this field who are leading the discussion on the future of making things.

Stratasys, a leader in 3D printing, is one example of a participating company that is bringing several new technologies to the fore. Wayne Benson, director of factory floor solutions at Stratasys, leads a team that works closely with manufacturers across multiple verticals to define the products, materials, applications, and software that can facilitate broader adoption of additive manufacturing for tooling and replacement parts.

Benson believes 3D printing technology will open up new vistas for fabricators. Equipment and tooling, for instance, will no longer need to be mass produced. Instead, it can be economically "printed" using the latest manufacturing techniques to tailor the tool specifically to the specialist who will be using it.

"Additive manufacturing allows for tooling like assembly aids to be customized per the operator's request — for left-handed,

continued on p. 25



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Ergonomic Semi-Automated Magswitch Lifting Systems

In today's manufacturing world, safety improvements and efficiency gains are key to staying competitive. Progress in both semi-automated and fully automated solutions in ergonomic lifting systems is driving growth at Magswitch Lifting Solutions. Stephen Meinhardt heads the lifting systems business unit at Magswitch Technology and is observing that ergonomics is playing a significant role and driving the need for safer and faster material handling.

Identifying the Problem

Buyer's Products, based out of Mentor, Ohio, had recently begun looking at ways to improve productivity and worker safety on their press brake line for snow plows. Picking the snow plow from the stack and loading them into the press brake was a slow process, relatively complex and a high-risk activity. The goal was to reduce the risk of injury and increase throughput in the press load and unload procedure. One of the challenges was how were the thin gauge snow plows going to be de-stacked from the delivery pallet. "This is where Magswitch has the advantage with our patented shallow field technology that delivers greater holding force on thin material and allowed for just one plough to be pulled at a time," said Meinhardt.

Development Process

"Understanding the work flow process is crucial to developing a solution. Collaborating with the customer for us is what makes these projects enjoyable and produces a product that we can be proud of. This starts with design and ends with implementation," says Stephen Meinhardt. Ben Walters, Regional Sales Manager, made several trips to Buyer's Products to meet with the team, gather information and discuss their current challenges. This was followed up with multiple design reviews with Magswitch's engineering team. The solution needed to present improved safety, efficiency, and better operator ergonomics.

The Verdict

The final result was a lifting frame that utilized Magswitch's shallow field patented technology to load and unload the snow plows safely and effectively into the press brake.



Speaking to key personnel at Buyer's Products provides a clear picture into the results that make this project a success. "The conclusion is that we are very happy with the lifting device. Once we had some practice and discovered the easiest way to hook the system up, we have seen significant efficiency gains. It has also proven to be much less strenuous for the operators to finish a complete run of parts. It is also apparent that we increased consistency in our bending since we were able to remove much of the human influence and can raise the plow skin in a more fluid motion,"

says Evan Lumby, Continuous Improvement Engineer for Buyer's Products.

"At Magswitch, our focus is to design and engineer lifting solutions that improves product guality, efficiency and safety," says Stephen Meinhardt. Meinhardt continues, "we are not just about selling a product, but creating a one on one relationship with our customer and understanding their specific needs." Today's solutions are tomorrow's customers. Magswitch sees this as an important part of their business strategy.

Caplugs: The Masking Experts

Caplugs has served as a leader in product protection, masking and custom molded components for 70 years. As experts in precision masking solutions, Caplugs offers the most comprehensive range of standard masking devices and in-house custom capabilities. Caplugs has over 6,000 standard catalog masking parts in-stock and ready to ship.

If one of the standard masking devices does not meet your needs, the design engineers will work one-on-one with you to develop a custom solution tailored for your application. Caplugs has six different molding processes to meet your unique needs and specifications, and the ability to do their own compound mixing with performance enhancing additives. With their expertise, the latest equipment and technology, and an in-house tool room -your masking solution can be prototyped, developed, and produced quickly and economically.

Caplugs masking solutions can eliminate laborious manual steps in the masking process and finishing preparation. Results include improvement in production line speed, reduced risk of failure and improved worker productivity, efficiency, accuracy, consistency and finishing quality. The broad range of parts securely protects your product during any finishing process, including:

- Powder Coating
- Anodizing
- Plating
- E-Coating
- Painting

Many of the Caplugs masking components are reusable, which can help cut down on costs and even help satisfy green objectives. Caplugs masking product offerings include:

- Caps
- Plugs
- Masking Kits
- Masking Tapes
- Masking Die-Cuts
- Hooks
- Bars

Racks



Caplugs offers an easy way to identify areas for improvement in your finishing process. Inefficiencies in application and removal often result in wasted labor and added costs. A masking analysis by an expert engineer at Caplugs could help you streamline your process to improve efficiency and save money.

Take the first step in optimizing your finishing process with Caplugs. Go to smartermasking.com for a free personal review of your masking process by a Caplugs engineer. You will also receive a copy of the Caplugs Masking 101 Guide, full of tips and strategies for getting the most out of masking, as well as a free masking sample kit from the complete line

of Shercon[®] masking products, including caps, plugs, tapes, and die-cuts.

Be sure to stop by and visit Caplugs during FABTECH at Booth B5433 to learn more. Additionally, the Caplugs expert masking specialist Chris Malone will be speaking in Session 28 on Tuesday, November 6th from 1:30 - 3:30 pm. His talk will be part of the First Things First - Hanging and Masking program. With 10 years of experience in the masking industry, Chris will discuss topics like masking to increase profits, the different types of materials used in masking components, and the importance of selecting the right material.

An exceptional team of customer service representatives is always there to answer your questions. Caplugs can provide a solution to your unique masking challenge. Visit caplugs.com/masking to learn more about our full product offering or call 1-888-CAPLUGS today.



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Get Connected with TRUMPF

Booth B6309 / Booth C10574 / Booth B5609

TRUMPF is showcasing its cutting-edge technology in three separate themed booths at FABTECH 2018: The Forming and Fabricating Pavilion, the Tube & Pipe Pavilion, and the Additive Manufacturing Pavilion.

In the main booth, booth B6309, the Forming and Fabricating Pavilion, TRUMPF will highlight its TruConnect approach to manufacturing through the customized production of a part. FABTECH attendees will receive live production updates as TRUMPF's innovative fabricating machinery, automation solutions, and supporting technologies work together to keep information and processes connected like never before. In addition, the TruServices team will be on hand to discuss how.

TRUMPF supports the entire life cycle of your equipment with the best financing options, training, consumables, tooling, service and other solutions.

Also on Display -TruLaser Cell 5030:

The new TruLaser Cell 5030 comes equipped with a solid-state TruDisk laser, flying optics and a state of the art NC controller and motion unit. This machine delivers a production increase of over 200 percent compared to typical hybrid machines - while saving 50 percent in operating costs. Advanced processing technology developed for TRUMPF's high-performance 5-axis product line ensures outstanding cut quality, process reliability, and flexibility.

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TruMatic 1000 Fiber:

The TruMatic 1000 fiber, TRUMPF's first entry-level punch laser combination machine with a solid-state laser, features a revolutionary modular design which enables users to add to it as business grows. The patented Delta Drive moves both the electric punching head and the laser along the Y-axis, while the sheet moves in the other direction. This increases machine dynamics, productivity and process stability, contributes to a significantly compact footprint, and enables material handling options such as the SheetMaster Compact. The machine's integrated protective housing, a requirement for safe laser processing, automatically moves out of the way during punching operations for maximum visibility and accessibility.

TruLaser: Laser Processing

The TRUMPF booth will feature the TruLaser 5030 fiber with a 10kW TruDisk laser which boasts high processing speeds and reproducible, high part quality, even for complex contours. TRUMPF will highlight the new TruLaser 1030 fiber with a Lift-Master Compact, and PartMaster, as well as the TruLaser 3030 fiber with a 6kW TruDisk laser and TRUMPF's Highspeed Eco technology.

TruBend: Precision Bending

The TruBend 3100 press brake, the TruBend 5130 press brake with ToolMaster, the compact and highly efficient electric TruBend 7036 press brake, and the TruBend Cell 7000 - the world's fastest system for automated bending of small parts - will also be on display at FABTECH. The hydraulic TruBend 5130 features a press force of 141 tons, a six-axis back gauge, and two patented angle measurement systems for maximum precision in bending. The I-Axis enables the machine to shift the die bed from one position to the next for hemming, multiple radius tools, or multiple height tools all in a single setup.

TruMark: Permanent Part Marking

With its excellent focus ability due to high beam quality, the TruMark 5020 is the ideal solution for high-quality engraving and the finest of structures. This fiber laser is the first choice partly because of the high productivity it delivers due to its high average power. At FABTECH 2018 the TruMark 5020 will be shown in a TruMark Station 5000.

TruTool: Portable Power Tools

TRUMPF's display at FABTECH would not be complete without its line of portable power tools for cutting, fastening, beveling, and deburring sheet metal. The TruTool TSC 100 slat cleaner will also be on display. This unique tool removes slag buildup on the support slats of 2D laser cutting machines without interrupting production and automatically adjusts to the thickness of the slag to maintain impressive working speeds as it travels.

At booth B5609 in the Additive Manufacturing Pavilion, TRUMPF will showcase the following products:

TruPrint 1000:

The TruPrint 1000 for additive manufacturing enables users to build metal components layer by layer using any laser weldable metal in powdered form. This laser metal fusion (LMF) process is ideal for parts that are complex in their geometry, such as those with internal channels and hollow spaces, short production runs, and individual parts. All components including the laser, optics, process enclosure, filter unit, and control cabinet are found within the TruPrint 1000's compact housing.

TruPrint 3000

The TruPrint 3000 is a universal medium-format machine with industrial part and powder management, designed for flexible series production of complex metal components using 3D printing. The TruPrint 3000 is ideally suited for general industry applications and is equipped with two 75-liter supply cylinders, which contain enough powder to complete the entire manufacturing process without having to stop. With times between build jobs taking as little as 30 minutes, this system has reduced potential downtime and increased overall productivity.

And finally, in the Tube and Pipe Pavilion at booth C10574, TRUMPF will showcase the TruLaser Tube 7000 fiber designed for fast and flexible processing. The open machine concept gives the TruLaser Tube 7000 fiber optimal accessibility during loading and unloading. Also, with Rapid-Cut, the high feed rates of the laser are noticeable even on smaller contours.

You can find each of these TRUMPF products at Booths B6309, B5609, and C10574.

GET CONNECTED with TRUMPF

FABTECH is the perfect opportunity to get connected with TRUMPF. With best in class equipment, automation components, vertical software solutions and experts that guide you every step of the way, TRUMPF is in the best position to support your smart factory. The demands of producing a high volume production of parts with smaller lot sizes require solutions that stay connected, adapt quickly and operate efficiently. TRUMPF provides solutions from stand alone machines to full systems across a wide range of processes. If efficient manufacturing is in your future, we invite you to stop by our booths at FABTECH and start your smart connection today.

Production Performance

FABTECH Booths B5609, B6309, C10574 / www.trumpf.com

TRUMPF

FABTECH Industry Night Featuring Coaching Legend Steve Spurrier

It's a football fan's dream. An evening at Mercedes-Benz Stadium, a world-class sports and entertainment complex and the home of the Atlanta Falcons. FABTECH Industry Night will include stadium tours, a visit to the locker room, on-field activities, and an evening packed with fun, food, drinks, and networking.



You also get a chance to meet Steve Spurrier, a legendary coach who won six SEC championships and a national title with the University of Florida in a career that spanned over 400 games. During his keynote address, Spurrier will discuss his career, his coaching philosophy, and how they apply to modern management.

"It's all about teamwork: a group of individuals working together to achieve a common goal is special. You need to get the leaders of your company together and set goals," says Spurrier.

Coach Spurrier will cover the value of the right attitude, the need to weed out



negativity, and what makes a real leader. Examples from his playing and coaching careers will highlight the value of a good work ethic and a determination to learn from those around you.

He believes that anyone in management has a job that is similar in many ways to that of the coach of a sports team. Spurrier continues, "the person that is supervisor, CEO, or the boss, they are trying to do what the head coach is trying to do: get the most out of their people. We're trying to inspire them to be the best they can be and encourage them to have a wonderful attitude." If the boss comes in to work in a bad mood or regularly displays anger, displeasure, fear, or just plain lack of interest, it rubs off on the workforce. But the opposite also holds true. The boss who brings enthusiasm, interest, and vigor to the workplace sees just how contagious the right attitude can be.

"The head guy has to come to work every day with that enthusiasm and that attitude that we're going to make it happen today. And that is contagious. That works in the work force as well as in football," says Spurrier.

EVENT DETAILS TUESDAY, NOVEMBER 6 6:30 PM - 8:30 PM

TICKET PRICE: Tickets are \$75 and include the keynote, entertainment, food, drinks, and more.

For those who do not have advanced tickets, you can go to Registration to check availability. We look forward to seeing you at the Mercedes-Benz Stadium tonight!





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Loss of a Legend: Inspiration for Rosie the Riveter has Passed

By: Michael Riobueno, AWS Instructional Designer

The manufacturing industry lost a legendary figure. Naomi Parker Fraley passed away on January 20, 2018. However, many of you might not know her by name. You might be more familiar with the iconic character she inspired: Rosie the Riveter. The famous poster was painted by Pittsburgh artist J. Howard Miller and posted throughout Westinghouse Electric Corporation plants in 1943.

It was part of a vast series of posters meant to both increase worker morale at home and court new employees for factories and the military. The massive influx of women into the workforce was necessary as the U.S. attempted to keep their manufacturing going 7 days a week to support the war effort.

Interestingly, the woman in the poster was not known as Rosie immediately. According to the Library of Congress, the name "Rosie the Riveter" came from a song released that same year by Redd Evans and John Jacob Loeb. Some of the lyrics of the song are as follows:

> "All the day long, Whether rain or shine, She's a part of the assembly line. She's making history, Working for victory, Rosie the Riveter."

The famous painter, Norman Rockwell, created his own version of the as-yetunnamed woman in the "We Can Do It!" poster that same year. The name Rosie is written on her lunchbox, perhaps indicating that Rockwell had listened to the song. It is because of the extreme popularity of Rockwell's work that the woman in the original poster received her signature moniker, Rosie the Riveter. Unfortunately, the poster faded into obscurity quickly, as many more were made and disseminated during World War II.

In a turn of fate, the 1980s rolled in and brought with it a revitalization of interest in Miller's work. This was reinforced by the fact that his initial poster could be easily reproduced, unlike Rockwell's work, which was under strict copyright. The depiction of a strong and capable woman in a position typically held by men inspired countless women and quickly turned Rosie into a cultural and feminist icon. Many women have claimed to be the inspiration for Rosie, including Geraldine Hoff Doyle. Doyle was a Michigan woman whose claim was repeated in obituaries when she died in 2010, making her the most accepted inspiration for Rosie.

However, while attending a convention for women who worked during the war some



years before Doyle's death, Fraley saw the photograph that Doyle said was evidence of her being the real Rosie.

Fraley immediately recognized herself as the subject of the photo. You can clearly see the iconic polka-dot head scarf and Fraley's uncanny resemblance to Rosie. Still, the photo was credited as being of Doyle, and with no proof of identity, there was not much Fraley could do.

Enter scholar James J. Kimble, who took on finding the identity of the "real" Rosie as a passion project. After years of research for something that would offer concrete proof of Rosie's inspiration, Kimble found the original copy of the disputed black and white photo. The key finding was a small line of text that read: "Pretty Naomi Parker looks like she might catch her nose in the turret lathe she is operating." It is through the efforts of Kimble that most now recognize Fraley as the original Rosie. In a 2016 interview, Fraley was asked how it felt to be known publicly as Rosie after going unrecognized for more than 65 years. Her response was to repeat the word "Victory!"

Sheridan Harvey shared the following quote made by Inez Sauer, a Boeing tool clerk during the time period in question, during a video presentation for the Library of Congress. Sauer's story, relayed below, is probably one that many women of the period share:

"My mother warned me when I took the job that I would never be the same. She said, 'You will never want to go back to being a housewife.' At that time, I didn't think it would change a thing. But she was right, it definitely did ... at Boeing I found a freedom and an independence that I had never known. After the war I could never go back to playing bridge again, being a club woman ... when I knew there were things you could use your mind for. The war changed my life completely. I guess you could say, at thirty-one, I finally grew up."

It's easy to see the impact WWII had on U.S. manufacturing and welding. What is harder to quantify is the impact made by thousands of untold stories of perseverance that made the workforce what it is today. Though Mrs. Fraley has passed, the character of Rosie the Riveter will continue to live on and inspire positive change around the world.

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Today's Smart Manufacturing Hub Presentation Schedule

Sessions are free and open to all attendees

Technical presentations from industry-leading smart technology providers will give insight on recent developments in this rapidly evolving field.

TUESDAY, NOVEMBER 6					
10:20 AM - 11:00 AM	A Hitchhiker's Guide to Metal Additive Manufacturing – The Have's and Have Not's to Evaluating Additive Made Parts Justin Joiner – South Region Manager, SLM Solutions NA, Inc.	Like any new endeavor throughout life, we all need to learn what we can and can't do when tackling life's problems and challenges. Metal Additive Manufacturing is no stranger to this notion with everyone undeniably celebrating its opportunity. But how can we approach its use through a tangible lens which embraces its freedom but also balances with reality? We'll explore this question in hopes that mice don't take over.			
11:20 AM - 12:00 PM	Extracting Actionable Insight from IoT Data Diego Tamburini, Principal Industry Lead, Azure for Manufacturing	In this talk, we will be discussing the topic of IoT analytics, and what's involved in extracting actionable insight from IoT data, including visualization, stream analytics, and machine learning.			
12:20 PM - 1:00 PM	How to Reduce Sheet Metal Design Risks and Production Costs Jamie White & David Puleo, Protolabs	You're bound to encounter a few twists and turns when designing parts for sheet metal fabrication. This presentation will briefly look at the multi-step manufacturing process involved in creating sheet metal parts and the various equipment used along the way. You'll learn which part features increase production risks, the resulting design implications, and most importantly, how to reduce that risk through design iterations. Tactics to reduce overall production costs will also be discussed.			
1:20 PM - 2:00 PM	Data-Driven Manufacturing: Monetizing Your Shop Floor Data David McPhail, CEO and President, MEMEX	No matter the size of your company, you can connect your manufacturing assets to your business systems today and be rewarded with a compelling ROI. However, it is not enough for manufacturers to just monitor machines to achieve maximum efficiency and profitability. They must also ensure shop floor data is collected automatically and in real-time, and then must analyze and act appropriately upon that data. In this presentation, MEMEX will use actual case studies to discuss a strategy for monetizing real-time shop floor data that is rooted in a pragmatic approach and focused on the business case outcome. • Take advantage of shop floor to top floor visual dashboards and team-sharing of real-time data enduce your company's operating costs by effectively increasing your plant capacity and a Reduce your connections to ensure "one version of the truth" elarn how an investment in Data-Driven Manufacturing can boost your bottom line results			
2:20 PM - 3:00 PM	Redefining Manufacturing with Metal 3D Printing Jonah Myerberg, CTO and Co-founder, Desktop Metal	Metal 3D printing technology has the potential to profoundly change the way companies produce metal parts, becoming a cornerstone to the 4th Industrial Revolution. Until now, 3D printing systems have been too expensive and slow, and require extensive safety measures due to dangerous lasers and metal powders. Join Desktop Metal for a deep exploration on the current state of the industry and hear key advances in metal 3D printing that make it accessible, affordable, and safe. Learn how and why major industries are turning to metal 3D printing for the mass production of parts and products, and hear early use cases that are driving the vision to redefine manufacturing.			
3:20 PM - 4:00 PM	The Future of Robotic Welding Pete Rogers, Vice President of Operations, Acieta	Robotic welding gives manufacturers the ability to maintain consistent throughput and quality during times of low labor availability in the marketplace. Even during times of rising labor costs, robotic welding keeps production costs low. Learn about this exciting new system for robotic welding from industry expert Pete Rogers with Acieta, a leading FANUC Certified System Integrator.			
4:20 PM - 5:00 PM	Metal Additive Manufacturing Myths: The Truth About Powder Reuse and Its Effect on Mechanical Properties Eric Mutchler, DMLS Product Manager, Stratasys Direct Manufacturing	There is a preconceived notion within the manufacturing industry that powder reuse and recycling for direct metal laser melting (DMLM) negatively impacts material properties and leads to inferior parts. Engineers, skeptical about material recycling, often specify a maximum powder age and require AM providers to discard all old powder. In reality, reusing and recycling powder with the proper controls not only has no effect on mechanical properties, but enables DMLM to be a more efficient and economical AM process. Stratasys Direct Manufacturing supports this theory through an 8-month long study conducted in parallel to serial production, focusing on powder composition and how it may or may not affect room temperature tensile properties of IN625. The mission to control, track, and develop the additi ve metals production process has led to increased confidence in DMLM. In this session, Stratasys Direct Manufacturing will go over the results from the study, and explain what proper powder reuse and recycling control could mean for AM.			







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SMART MANUFACTURING HUB LOCATION 6 $\left[\begin{array}{c} \mathbf{C} \end{array} \right]$ **ENTRANCE ENTRANCE** (Ŷ. то τo A/B A/B CONNECT CONNECTOR BTECH \star FREE TECHNOLOGY SESSIONS ALL DAY! HALL A/B CONNECTOR = Smart Manufacturing Hub Located in the A/B Connector Booth AB2798 HALL A/B CONNECTOR HALL A2 ΗΑΙΙ ڪ ENTRANCE ----- (<u>***</u> ſ٢.

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What's the Industry Outlook for 2019?

ENTRANCE

Manufacturing in the U.S. has successfully adapted to changes in customer needs and shifts in the competitor landscapes, while still focusing on profit margins and revenue growth. Production in the U.S. is estimated to grow 2.8 percent from 2018-2021 (a faster increase than other segments of the general economy), and manufacturing continues to have an outsized influence on regional economies. According to the U.S. Bureau of Economic Analysis, manufacturing generates \$1.40 in economic activity for every dollar put in.

At a session on the state of the industry at FABTECH 2017, the panel concurred that, barring any unforeseen developments, manufacturing will continue to be a healthy industry moving forward. The panelists also agreed that the United States' "competitive position is improving in a global manufacturing market in the midst of a digital revolution."

Along with this growth trajectory, there are a few lingering questions. For instance, as a result of the projected growth of manufacturing, the need for skilled workers in areas like metal forming, fabricating, welding and finishing has also risen. Welding alone will need an estimated 90,000 welders around the country by 2024. Companies are actively working to address this. A National Association of Manufacturers report highlights how many organizations are successfully partnering with community colleges and high school career programs to build a pipeline of future skilled workers. Other companies like GM are embracing new technologies and working to attract young engineers focusing on digital services.

Along with the labor shortage, questions regarding American-made goods being reintroduced into export markets as well as end user motivation for products like cars are also being debated. In response to recent tariffs, the Alliance of Automobile Manufacturers — a trade association for producers like GM, Ford and Volkswagen — is working to educate the public and Congress on concerns surrounding these administrative actions.



ENTRANCE

"Industry professionals have questions about what the future holds, and we want to provide a place for them to find the answers and innovations they need to face the ever-changing manufacturing landscape," stated John Catalano, SME senior director, FABTECH. Catalano continues, "FABTECH is dedicated to providing a platform for the industry to collaborate, discover innovation, share ideas and participate in education sessions that highlight solutions and tactics our attendees need to accelerate and grow their businesses." These panel sessions at FABTECH 2018 will help shape the industry outlook in 2019:

DAY

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- Innovate, Accelerate and Advance Manufacturing today, Nov. 6 at 12:30 PM
- State of the Industry tomorrow, Nov. 7 at 12:30 PM
- Manufacturing and the New Generation Workforce Thursday, Nov. 8 at 10:30 AM

Automated Bending Enhanced by Robotic Technology

AMADA's HG 1003 ARs utilizes the combined forces of an ultra-precise press brake and a 7-axis robot to achieve maximum productivity and unattended processing. Designed to handle sheets up to 39" x 31", the system's robot can support loads up to 44 lbs.

Maximum Flexibility

The 7-axis robot moves on a linear track to provide efficient stage bending with the flexibility to process materials anywhere along the entire length of the machine. Additionally, the HG 1003 ARs is equipped with an extended backgauge system. AMADA has re-engineered the backgauge to provide unprecedented precision. Instead of two stops, there are now three. As with the previous design, two stops are for adjusting the depth of the part. Now, a third stop provides for lateral alignment. If required, automatic readjustments are performed immediately in both the X and the



Y-axes. Two backgauges can be adjusted to different depths in the X-axis (Delta-X function) to ensure precise bending even if parts are asymmetrical. In addition, the ability of the robots to achieve optimum positioning at the backgauge has also been enhanced. Parts can be moved forward, backward, and even rotated once they have reached the stop to ensure the correct bending position.

Precision and Process Reliability

An integrated camera system eliminates positioning errors when picking up sheets of material and also helps to ensure precise loading. The camera records the precise position of the material (which may have been misaligned on the stack) and transmits this information to the robot. Even the smallest of discrepancies can be detected and accurately compensated for, as early as sheet pick-up. During production, accuracy and process reliability are ensured by an angle measurement system that monitors bending operations in real-time.

Additional automated features that are available for the HG 1003 ARs include an Automatic Gripper Changer (AGC) and an Automatic Tool Changer (ATC). As soon as a program requiring a different gripper is loaded, the robot automatically positions itself at the appropriate gripper station and completes the change. Similarly, AMADA's patented Automatic Tool Changer swaps tools and ensures that they are precisely positioned, thereby eliminating the need for position checks. As a result, tool setup times are reduced to a minimum and errors are eliminated.

In summary, AMADA's HG 1003 ARs is an innovative bending solution that leverages automation and robotic technology to increase precision and process reliability. Additionally, this new bending system eliminates errors and costly delays associated with manual setup. Now, even small lot processing can be performed cost-effectively.

Visit AMADA in Booth B6909 to learn more!

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How a Fab Shop Earned 24,000 Instagram Followers

When customers' purchasing habits changed, a fab shop decided to change its marketing approach.

By: Katherine Burrows, SEO copywriter at Tangible Words

Paul Vreugdenhil of The Machining Center Inc., Quinte West, Ont., turned to Instagram to attract talent and new customers. So far it's worked out pretty well.

Twenty-nine years ago in Quinte West, Ont., The Machining Center Inc. (TMC) was a small startup company focused on custom machining and fabrication. Over the years it has grown consistently, always looking for new business opportunities in the Bay of Quinte area to serve other companies.

TMC has made a name for itself as a reliable manufacturer of replacement parts for a variety of machinery. Even if the equipment is 50 years old with no available drawings to go by, the shop has been known to work its magic.

"What separates TMC from our competition is that we document almost everything we do and can repeat that same work years later without a used part to work from," said Paul Vreugdenhil, owner (see Figure 1). When customers call to request a replacement for a part that TMC made for them 10 years ago, Vreugdenhil can find the information on file and reproduce the same part.

The Changing Face of Business

Twenty years ago TMC's work came from phone calls or face-to-face meetings; the TMC team visited companies and got purchase orders by handshake.

As internet use grew, the people involved in purchasing decisions changed. Previously, maintenance people awarded the purchase orders. In the age of lean, the purchasing manager — typically someone who didn't interact with the actual product — took over the task.

This was a barrier that caused relationships with manufacturing companies to dry up because that personal relationship with the customer was lost. To overcome this barrier, TMC decided to go online. Initially, Vreugdenhil tried Facebook, but eventually he decided that his social media strategy would be more effective on Instagram.

"When looking for social media apps, we wanted to increase access to our services and let people see what we're about," said Vreugdenhil. "We're trying to really connect with people out there and show them who TMC is."



Paul Vreugdenhil, owner, The Machining Center Inc.

Through the use of social media, TMC started new relationships with the purchasing managers the company needed to reach. And it has worked.

Build Your Presence

"It is important to be strategic about your social media marketing, so it becomes a natural extension of what the company already does and furthers its existing mission," said Alysha Dominico, CEO and founder of Tangible Words, the marketing company that helped TMC with its social media strategy. "Social media should not be an 'extra' but an enhancement to the pursuit of achieving your company's strategic priorities."

Ideally your social media strategy should expand your reach to increase exposure to potential clients, demonstrate your company



culture in a way that highlights its creativity and personality, nurture relationships by creating collaborations with others, give your audience a peek behind the scenes at your company to generate anticipation for upcoming products or events, and share industry news and best practices to develop a network of like-minded colleagues.

Photo Finish

Although other social media channels can serve these functions in whole or in part, Instagram was the best fit for TMC. "I chose Instagram because it was a place to see lots of pictures," said Vreugdenhil. "We make many different types of parts for manufacturing and use an array of processes to make those parts. I estimated that pictures of these processes would help us quickly connect with the trades and people in manufacturing we wanted to meet."

Log in to like or comment.

Instagram is a very visual social media platform, with a focus on sharing photos and videos to connect people through profile name, hashtags, and places. For example, if you want to find book authors, you can search people by the word "author" and see anyone who has that word in their profile name or profile description.

continued on p. 18



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How a Fab Shop Earned 24,000 Instagram Followers

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TMC can use the search function on Instagram to find potential customers amongst the large manufacturing cluster in the Bay of Quinte.

"When I want to find and connect with more local businesses, I search 'places.' For example, the search term 'Belleville Ontario' shows me posts of anyone using that location within their posts," Vreugdenhil explained. A quick glance at these profiles and Vreugdenhil knows if they are in manufacturing, and therefore a potential customer for TMC to pursue.

Rebuilding the Personal Touch

To get started on Instagram, the company focused on growing its account by building a page and using hashtags to connect in purposeful, specific ways with people.



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 Wednesday, Nov. 7
 10:00 AM - 4:00 PM

 Thursday, Nov. 8.
 10:00 AM - 3:00 PM





The people who post on Instagram use hashtags to categorize (or file) their posts by topic, industry, and geographic location. Others can then search by hashtag to get all posts related to that category. The site has recently added the ability to follow hashtags as well, so a user can stay tuned in to the hashtag to see all the posts on that topic.

"Hashtags are the glue that tie posts together," Vreugdenhil explained. "If you do a post without hashtags, likely only your followers will see it."

For example, if you post a hashtag-less picture of your dog on an account with 20 followers, you will probably only get 5 to 10 likes. If you post that same picture with hashtags like #dog, #doggie, #doglover, #poodle, #pet, #bellevilleontario, and #canada, it might get 30 likes, because people who want to see dogs search those tags, and people looking at Canada could also stumble across the post. Hashtags extend the reach of your posts because they allow people with multiple interests, such as "Canada" (for travel) and "dogs" (for cuteness), to intersect.

And if a person who found your post via the dog and Canada hashtags sees that your account has lots of dog pictures (showing that you are predictable and thus creating trust), that person might not just like your post but also become a loyal follower. When two profiles intersect in goals, meaningful relationships can start.

In this same way, TMC's posts have intersected with manufacturers who have fabrication needs, leading to a positive and successful social media experience for the company.

When asked how he knows which hashtags to use, Vreugdenhil has a straightforward process.

"Pick the word or topic you want, then search for that hashtag. Look through the posts that come up under your search term. Identify the posts that have over 100 likes already. See which hashtags they use and use the same ones. I use my notepad on my phone and the clipboard," he said. "I simply paste in the same hashtags all the time."

TMC's strategy to build a large following is simple.

"I like lots of pics," said Vreugdenhil. "It's all about human nature. People want you to see their stuff. They want you to

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Education Program

TUESDAY, NOVEMBER 6

Want to attend an education session? Go to event registration located in the **Registration Hall (between Halls A & B)** to register. Fees apply.

TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3	3:30 PM
3D/ADDITIVE MANUFACTURING	NEW! F10: Revolutionizing 3D Additive Manufacturing 1 Room B313	NEW! F20: Introduction to Additive Manufacturing and 3D Printing Room B313	F30: Fundamentals of 3D Additive Scanning and Imaging 1 Room B313	
AUTOMATION	NEW! F11: Robotics and Automated Systems for Joining and Laser Industry 4.0 1 Room B314	F21: Getting Started with Robotics B Room B314	NEW! F31: Automation Software for Fabrication Business 1 Room B314	
CUTTING/LASER	NEW! F12: Lasers and Innovative Industrial Applications 1 Room B305	NEW! F22: Advanced Fiber Laser Applications & Developments Room B305	F32: Comparative Cutting Systems with Tech Tour 1 Room B305	
FINISHING		C20: Building Blocks of Powder Coating B Room B301	C30: The ABCs of Infrared Room B301 NEW! C31: First Things First - Hanging and Masking Room B302 C32: New or Improve - What's Best for Your System Room B303	
		C21: Fundamentals of a Successful E-Coat Operation B Room B302		
		C22: Pretreatment Challenges Room B303		
FORMING & FABRICATING	F13: Coil Processing: Advancements in Slitting, Leveling and Storage 1 Room B406	NEW! F23: Press Brake Springback Solutions Room B406	F33: Press Brake Safety: ANSI B11.3 Explained I Room B406	
	F14: Roll Forming: In-Line Punching, Cutoff Dies and Press Tonnage 1 Room B407	F24: Welding Advancements for Tube & Pipe Room B407	F34: Tube & Pipe: Bending 1 Room B407	
LEAN	NEW! F15: Lean Principle: Strategic Planning and Organizational Alignment A Room B309	NEW! F25: Lean Principle: Developing Your People 1 Room B309	F35: Lean Tools: Value Stream Mapping, Addressing Differences Between Office and Shop Floor I Room B309	
MANAGEMENT	F16: Fundamentals of Activity-Based Costing & Estimating 1 Room B304	NEW! F26: Rising Above It All: The Art and Science of Organizational Transformation 1 Room B304	NEW! F36: Becoming a Learning Leader and Avoiding the Fatal Flaws of Failure Part I and Part II 1 Room B304	
MARKETING & SALES TOOLS		NEW! F27: Increase Your ROI with Digital Marketing for Manufacturers I Room B310	NEW! F37: Marketing Bootcamp: Technology, Prospects & Voice of the Customer B Room B310	
SMART MANUFACTURING		NEW! F28: Roadmap to Smart Manufacturing Transformation 1 Room B308	NEW! F38: Smart Manufacturing Technology & Workforce Ready B Room B308	
STAMPING		S20: Machine Safety - Safeguarding Overview Room B315	NEW! \$30: Machine Safety - Alternative Methods for Applying Hazardous Energy Control I Room B315	
		S21: Lubrication Technology I Room B316	NEW! S31: Sensor Technology - Eliminating Die Crashes 1 Room B316	
WELDING FABRICATION		NEW! W20: Welding for Steel and Aluminum Applications 1 Room B406A	NEW! W30: Welding for Laser & Cutting Repair Technology I Room B406A	
WORKFORCE DEVELOPMENT	NEW! F19: 8 Elements to Effective Delegation & How to Get More from the People You've Got Room B312	NEW! F29: Innovative Techniques to Manage Significant Improvement and Change Initiatives 1 Room B312	NEW! F39: The Beauty of Being Lost: Make Better Decisions & Lead Change In Your Organization I Room B312	
WELDING				
	W10: NDT Day - Room: C205		8:00 AM	5:00 PM
SEMINARS	W13: CWI Part B Hands On Experience - Day 1 - Room: C301		8:00 AM	5:00 PM
	W14: Welding of Stainless Steel - Day 1 - Room: C302		8:00 AM	5:00 PM
CAREER PATH WORKSHOPS	W16: Starting a Welding Inspection Business - Room: C207		10:00 AM	12:00 PM
	W17: Creating a WPS in 60 Seconds - Room: C207		1:00 PM	3:00 PM
	W18: Welding Engineers Round Table Discussion - Room: C207		3:00 PM	5:00 PM
	W23: Session 1: Additive Manufacturing - Room: C101		8:00 AM	12:00 PM
PROFESSIONAL PROGRAM	Session 2: Modeling and Numerical Analysis I - Room: C102		8:00 AM	12:00 PM
	Session 3: Welding Metallurgy - Room: C107		8:00 AM	12:00 PM
	Session 4: Sensing and Control of Welding Processes - Room: C101		2:00 PM	5:00 PM
	Session 5: Solid-State Processes - Room: C102		2:00 PM	5:00 PM
	Session 6: Weldability Studies - Room:	: C107	2:00 PM	5:00 PM
EDUCATIONAL SESSIONS	W28: National Center for Welding Education and Training, Weld-Ed - Room: C201		10:00 AM	3:00 PM
RWMA SCHOOL	W22: RWMA Resistance Welding School - Day 1 - Room C110		8:00 AM	4:15 PM

Detailed Education Program session descriptions, speakers, pricing, room locations and more can be found at **fabtechexpo.com/edu**.

B = Basic **I** = Intermediate **A** = Advanced

CCAI Expands its Women in Finishing Group

Powered by the Chemical Coaters Association International (CCAI), Women in Finishing (WiF) kicked off at FABTECH 2017 with a very successful reception. Since that time, the group has been expanded and provides a platform that fosters personal and professional development for women who have



chosen or are considering a career in the finishing industry. "We are excited to

have expanded the Women in Finishing program," noted Women in Finishing manager, Sheila LaMothe. "The response to this program has been so positive that offering more activities for this group is a natural progression."

WiF programming and resources enable members to:

- Expand their professional networks
- Build leadership skills
- Exchange information and ideas
- Build confidence
- Benchmark best practices
- Address business and
- operational challengesInspire future generations of women in finishing
- Access resources that set the stage for a successful career



WiF hosts a number of networking events throughout the year, enabling members to connect in a relaxed, social atmosphere. Women active in industrial finishing are encouraged to join us Wednesday, November 7 at 4:00 PM in the CCAI booth (B4700) for this year's Women in Finishing reception. After a busy day on the show floor the reception is a great place to meet other women in the industry and learn more about WiF membership and programming.

Additional programming in the works for 2019 includes a networking event at CCAI's annual meeting, a webinar program and an annual retreat. Focused on professional and personal development, the webinar program provides an accessible avenue to education and development that can be shared with all women in your organization.

WiF's annual retreat will be a catalyst to help members re-energize and reposition their professional and personal lives. Through unique programming, participants learn new ways to deal with issues that impact effectiveness, provide balance between personal and professional life, discover relaxation and stress management tools, maximize professional impact, build strategies for success, and much more. Watch for additional details in the coming months.

WiF is inclusive of all levels and responsibilities within the finishing industry, from the finishing line to executive management. Membership is free to all CCAI Corporate, Custom Coater, Individual, and Student members. For more information and to join, visit **ccaiweb.com/WiF.**



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How a Fab Shop Earned 24,000 Instagram Followers

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comment on their stuff. If you do, you will get followers. Yes, it takes a fair bit of time at the beginning. If you are a business and want to sell or promote your company, get in their faces! Show some love, and they will love you back."

Vreugdenhil admitted there was a learning curve. He jokes about himself as the grayhaired social media guy. But he knows what he's doing in rebuilding the personal touch (see Figure 4). Unless an account is set to private, he responds to each new follower on his page. He takes the time to like one of their photos and thank the person for following TMC.

TMC's account is now up to 24,000 followers. Vreugdenhil uses hashtags to organize posts and make connections. He started using #engineering, for example, to attract people who are designing prototypes and new equipment to be built.

Company Goals

The company is using Instagram to align with its strategic goals.

Create pride and share company culture. TMC posts photos of daily jobs, work processes, and interesting stuff that other machinists or fabricators might be interested in seeing too. Employees can show their kids the photos when they go home and talk about their day.

Seeing their work online boosts employee morale, fosters positive workplace culture, and gives employees another reason to take pride in their work. Now, employees look for photo and video opportunities, because they have their own stake in what is being posted. When tradespeople see this, they respond. TMC has not only hired people who first connected with the company via Instagram, but the company succeeded in attracting the top two students from local Loyalist College's industry program.

"Having employees who are helping to drive the collection of photos and videos decreases the burden of having to create content," said Dominico. "It's also a great way for a company to amplify its message: Post creators tend to reshare those posts to personal accounts and therefore their network."

Encourage professional development. TMC posts information about new tools and processes, techniques that have worked well, and how it solved specific fabricating challenges. In turn, its employees can learn from other fabricators and machinists that post similar information about their own shops.

This supports and reflects a workplace culture of sharing among employees and other colleagues. Through this sharing,

TMC even found a new tool that helped cut the time required for a particular job in half.

Attract new customers. Posting about its fabricating processes, TMC shows current and potential customers how it is different from other shops. Through social media,

TMC has built a community in Canada and the U.S. with buyers of its services and products. The firm has won multiple new short- and long-term clients who reached out first on Instagram.

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Apprenticeship Programs and Unfilled Positions on the Rise

By: Peter Ulintz, technical director, Precision Metalforming Association (PMA)

Skilled, educated and adaptable workers, willing to retrain and update their skills to keep pace with changing technology, often emerge from company- and government-sponsored apprenticeship programs.

What is an apprenticeship? It is a combination of on-the-job training and related instruction for skilled occupations. Sponsors of such programs include employers, joint employer and labor groups, and employer associations. The good news is that such programs are on the rise.

Nationally, 21,000 registered programs have more than 505,000 apprentices enrolled as of 2016, a figure that has climbed 29 percent since 2011, according to the U.S. Department of Labor. However, the real number of apprenticeships likely is larger because unregistered apprenticeships, which the Department of Labor cannot track, also exist.

Employers and apprentices seem happy with the system, with a 2009 report from the Urban Institute showing that nine of 10 employers would "strongly recommend" registered apprenticeships. Moreover, 65 percent of employers experience program-completion rates above 70 percent, better than the 59-percent, 6-yr. graduation rate for college students (reported by the National Center for Education Statistics) in 2017.



Wanted: Apprentices

So what's the bad news? As apprenticeship programs are on the rise, so, too, are the number of unfilled apprenticeship positions. While employers report concerns about the bureaucracy and time required for registering new apprenticeship programs, the bigger issue appears to be the need for more apprentices.

Professional trades such as advanced design and CNC automation programming for manufacturing cells are two career paths lacking skilled workforces. In addition, automotive and other industries need welders and welding technicians with skills and experience working with advanced high-strength steels, stainless steels and aluminum alloys.

Looking ahead, new materials require new process technologies, and the skilled technicians to implement, optimize and support them. The same is true of emerging technologies such as composite sheet forming and additive manufacturing. In addition, as new fuel-cell technology, hybrid and electric-powered cars, and autonomous



vehicles enter the marketplace, production will require specialized skills, as will maintenance and repairs.

Challenges for Employers

With fewer teens working during high school, there is an ongoing need to equip them with practical training and hands-on experience to help with securing skilled manufacturing positions after graduating.

However, despite the many advantages of apprenticeships, there has been no great rush by young people to become apprentices. Instead, for many, a college degree remains their primary goal after high school.

Moreover, there continues to be a degree of social stigma attached to those who do not pursue academic degrees. College-educated parents may support apprenticeships in principle, but in practice, they like it more when other people's children become apprentices.

However, companies and trade unions wanting to attract apprentices can and should borrow a page or two from university recruitment practices of student athletes. In other words, roll out the red carpet. Give apprentice candidates a "campus tour" of your facilities. Provide them with presentations highlighting the benefits of being an apprentice. Hold receptions where recruits can interact with company executives and employees. In other words, make them feel important, because they are.

Finally, just as coaches meet with student athletes and their parents, meet with the parents of potential apprentices. Family buy-in is crucial when young people are making life-changing decisions, and that certainly includes apprenticeships. END

Peter Ulintz, technical director at the Precision Metalforming Association (PMA), has worked in the metal stamping and tool and die industry since 1978. His background includes tool and die making, tool engineering, process design, engineering management and advanced product development.

As an educator and technical presenter, Ulintz speaks at PMA seminars, roundtables, international conferences and college and university programs. He also provides onsite training and consultations to the metalforming industry.



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Safety Lessons From an FMA Safety Award Winner

A safe work environment often leads to a profitable organization.

By: Dan Davis, Editor-in-Chief, All metal fabricators undertake new Initiatives all the time. Sustaining those

A five-time FMA Safety Award of Merit winner shares his thoughts on maintaining a safe work environment. All metal fabricators undertake new initiatives all the time. Sustaining those efforts over a prolonged period of time can be a bit more challenging. Permanent behavioral change does not come easy.

When it comes to changing safety behavior in a manufacturing facility, the stakes are high. After all, the goal is keeping everyone safe so that they can return home in the same condition they went to work.



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PlayCore, a manufacturer of playground and recreation equipment with headquarters in Chattanooga, Tenn., has enjoyed one of its manufacturing locations, the Southern Fulfillment Center in Fort Payne, Ala., honored with the Fabricators & Manufacturers Association's Safety Award of Merit for five consecutive years. (The Safety Award of Merit is given to FMA member companies that have an injury and illness rate for the reporting period that is better than the published Bureau of Labor Statistics rate by 10 percent or greater, based on their NAICS code.) To find out some of the things that the company has done to maintain its safety streak of excellence, The FABRICATOR spoke with Darrel Shankles, PlayCore's health and safety manager and chair of FMA's Safety Council. He has been with the company for 11 years and is based at the company's Fort Payne facility.

The FABRICATOR: What are some of the most common health risks at PlayCore?

Darrel Shankles: It's mostly sprains, strains, and lacerations related to material handling and the job in general. The metals shop is approximately 80 percent of the manufacturing staff. Here we work with galvanized pipe, sheet metal, and tube. We bend, shape, form, cut, drill, weld, paint, and package the metal. We also have a plastics department where rotational molding is performed. This process produces the slides, roof tops, and other play accessories.

We are essentially a job shop. We have about 25,000 different parts. We work with customers to design their unique play units, and then all of the parts are custom-built, molded, and painted to their unique specifications.

FAB: What is done to prevent some of these health risks?

Shankles: My goal is to teach all employees to be a safety manager. I tell every continued on p. 27

FABTECH Smart Manufacturing Hub continued from p. 1

right-handed, tall, or short people," said Benson. "They can now have a tool designed and printed to specifically meet their needs on the factory floor. It has now become much more economical to produce these tools in guantities of one or two."

Additionally, he explained how 3D printed tooling can be harnessed in metal forming applications such as hydroforming, which is used to form very complex curvature, thin gage metal parts. The punch used in these applications can easily be produced by a 3D printing machine. 3D printers can be rapidly programmed to produce many other components with complex geometries.

"Forming pressures are well within the range that a printed tool can withstand because it's spread out over a large enough surface area on the punch, and the metal is thin gauge," said Benson. "It is the same with press brakes: custom geometries such as joggle bends or embosses that can't be formed with standard, on-the-shelf V-die press brake tooling can be formed with printed tooling."

Benson will co-present with Dan Burseth, Vice President at Eckhart, a leading integrator of Industry 4.0 solutions for the largest assembly operations in the world. Burseth has engineering degrees from M.I.T. and Northwestern University. In his role at Eckhart, he works with Fortune 500 OEMs to improve throughput, assembly quality, and complete cost reduction activities using a suite of solutions that includes autonomous guided vehicles, collaborative robots, additive manufacturing, and more.

Their talk is entitled, "From the Frontlines: Realizing the Benefits of Additive Manufactured Tooling." They will cover how both large and small assembly operations are using additive manufacturing to reinvent factory tooling. This session explores why some organizations are realizing the benefits as advertised and other organizations are struggling to incorporate these technologies into their assembly lines.

Benson urged industry veterans with traditional fabricating skillsets to attend. He predicted that they will be surprised by the versatility and flexibility of AM, and how easily they can incorporate 3D printing into the workplace.

"Once they understand how strong some of the printed materials are today, they really start to think differently in terms of how it can be used," said Benson. "They realize it doesn't always have to be a machined metal tool even though that's been the mindset for years. When they see that the same goal can be accomplished with a printed thermoplastic, it really opens the door to new ideas."

3D Printing with Metal Powders

But plastics aren't the only game in town when it comes to 3D printing. Metals are increasingly being used to build sophisticated components. You can learn more about that in the Smart Manufacturing Hub from SLM Solutions, another leader in AM. Justin A. Joiner, regional manager — south for SLM Solutions NA, will deliver a presentation, "A Hitchhiker's Guide to Metal Additive Manufacturing — The Have's and Have Not's to Evaluating Additive Made Parts."

He has been involved in the engineering technologies industry for almost a decade, having worked alongside many Fortune 500 companies to small shop sole proprietors. His focus at SLM Solutions is helping companies realize everything from design freedom, weight reduction, manufacturing costs, customization and costs savings with best-in-class metal powder bed laser additive manufacturing systems.

Like any new endeavor throughout life, he said, it is important to learn what can and can't be achieved with 3D printing. It is wonderful for certain things, and poor at others. A 3D printed part is formed by laying successive layers of powder down, one on top of another. That works very well in parts with certain angles, and not for others. Similarly, 3D printers have size limitations — although new and larger equipment appears on the market with regularity. Joiner will explore the limits as well as the great many possibilities this innovation offers in fabrication and in manufacturing as a whole.

Robotics and Welding

To learn about robotics, robotic welding and Robotically Integrated Bending Solutions (RIBS) visit Acieta, a leading FANUC Certified System Integrator, at the Smart Manufacturing Hub and attend one of their many presentations. Pete Rogers, Vice President of Operations at Acieta, has deep experience in programming, installing, and managing automation systems. For the last 11 years, he has been involved in the sales, engineering, programming and project management for welding and other projects at Acieta. Rogers will discuss the future of robotic welding.

Robotic welding, he said, gives manufacturers the ability to maintain consistent throughput and quality during times of low labor availability in the marketplace. Even during times of rising labor costs, robotic welding can keep production costs low. His presentation showcases a new system for robotic welding and how to utilize robots to make welding processes more productive and profitable.

Additionally, Acieta experts will cover the business necessities that drive the adoption of robotic automation. With the swift pace of technological evolution, maintaining the status quo is not an option for manufacturers. The struggle to secure quality labor is driving more and more fabricators and manufacturers to learn how robotic systems can enable them to deliver higher quality parts and maximize throughput while keeping their workforce numbers consistent and employees safe.

Speakers will also lay out business plans to help traditional manufacturers transition gradually towards more and more automation. No two companies are alike. Each must devise the right strategy that satisfies existing customers while multiplying revenue streams. By incorporating robotics smartly, businesses can achieve this without the need for massive upfront investment.

This is a mere sprinkling of what can be learned, discussed, and tried out in the Smart Manufacturing Hub. We may not be able to beam you back to your office direct from the show floor — yet. But the many technologies on display are an essential part of this year's FABTECH experience. Those who wish to thrive in the modern era must prepare themselves to boldly take their manufacturing operations to places never dreamed of only a few short years ago.



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in 1991 by a management group of six individuals who had worked together in the industrial sheet metal fabrication business since 1973. Originally, this group was involved in air filtration systems, but branched into finishing systems for the furniture industry in 1980. Since that time, and upon its founding, Pneu-Mech Systems has directed manufacturing/sales efforts strictly towards finishing systems equipment (both liquid and powder) for metal, wood and composite materials for all industries. With over 70 employees, Pneu-Mech can complete "turn-key" projects of most any size and is a custom manufacturer that builds systems to fit the needs of customers. Pneu-Mech Systems' philosophy is "To deliver to our clients not only our equipment, but our knowledge."

Pneu-Mech Systems was established This enables the end equipment users to in 1991 by a management group of six produce both profits and a quality finish.

Pneu-Mech Systems' two Statesville, North Carolina manufacturing facilities, with over 75,000 sq. ft., are equipped with all the essential equipment. Hi-definition plasma cutter, metal shears, press breaks, spiral duct fabrication and saws to fabricate specialized and custom paint systems from flat metal to finished equipment. The fabrication staff is highly experienced in the craft of building systems in modular form to be freighted to the customer's facility and shorten the installation process.

Pneu-Mech's capabilities to supply finishing equipment, including pretreat washers, ovens, conveyors, paint booths and other ancillary finishing equipment makes them a great choice as a supplier.



The installation staff is highly experienced in the mobilization, rigging and placement of specialized finishing systems. Pneu-Mech is proud of their staff, highly trained and experienced in the installation and integration of their systems to meet customer needs. Focused on "being easy to do business with," Pneu-Mech provides training, production assistance, troubleshooting and all service work required to install and maintain their systems. Visit Pneu-Mech in Booth B5409.



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Safety Lessons From an FMA Safety Award Winner

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employee that I want them to know as much as I do, and I want them to assess risk and be a part of managing their own safety efforts.

FAB: What was the safety effort like when you first went to work for PlayCore?

Shankles: The company was looking to create a better workplace. They had the understanding that a safe workplace is a better workplace from the standpoint of cost and just being a good citizen of the community.

They felt that a safe workplace is where they wanted to go because of safety and profitability being very closely related.

When I first started, our injury and workers' comp rates were higher than similar manufacturing facilities of this type. The safety program had lots of opportunities to improve. The company understood they wanted to take action to get things under control.

FAB: What were some of the first activities that you initiated to help change that culture?

Shankles: We first began with an emphasis on marketing safety in the workplace: Employees' safety is important. The first year we had lots of food rewards, feeding the plant and individual departments whenever they did safe work. That was a large part of it. Good food gets folks' attention!

We also changed up orientation for new employees. A large emphasis on safety was added. During this time in the process, we were a much more seasonal employer. I knew that getting new employees behind safety would change a lot of things.

The newcomers helped to change the employees who had worked here for a long time. We have a lot of longtime employees — 25-, 30-, 35-year employees. Changing them was kind of like changing the direction of the Titanic. It was very slow.

We also began depending on employees that serve on the safety committee. Listening to this group helped to find areas that we could work on. The safety committee played a huge part in the turnaround.

Even with these efforts, we knew things weren't going to change overnight, but we saw some changes. We went from 32 injuries, which occurred the year before I started here, to 16 injuries in my first year. Then the next year it was eight injuries. We kept driving that down in the first few years. Being able to show company leaders that safety does pay was a great reward for me as the support for the safety program grew exponentially. We cut the mod rating in half. ["Mod rating" is short for experience modifier or experience modification. It's a rating that is used to adjust an employer's premium for workers' compensation.] So suddenly insurers really want to insure us.

FAB: Do you still use rewards of some type to reinforce safe behavior?

Shankles: We certainly offer positive recognition for people doing things safely. continued on p. 28







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Safety Lessons From an FMA Safety Award Winner

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We give them free lunch cards and other small tokens of appreciation when a positive behavior is witnessed. These can be awarded to anyone, and anyone can suggest them as a reward for others in the facility.

We also reward team members for hitting benchmarks and for achieving positive results. We recently worked 6.5 million hours without a lost-time accident. Each time we would hit a million mark, we would give away a token, such as backpacks, shirts, jackets, lunchboxes, and coolers. Sometimes I feel like I've turned into a safety marketing person. You have to keep safety in front of your team!

We also use other items for rewards when team members participate. For example,



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we provide extra-nice personal protective equipment and gift cards. This may be for team members that are going the extra mile, such as identifying where additional safety measures could be implemented. When you reward folks, they have the incentive to be a part of the program, and the next thing you know you have people competing for those rewards.

Safety surveys each year are useful as well. We use them to determine what people think about safety in the shop and what their attitudes are. This way we can focus on areas that we know we are lacking in.

FAB: When you have new employees and contract workers come in, how is safety integrated into their orientation?

Shankles: We put a lot of emphasis on new-employee orientation, which lasts about five hours. This orientation also covers temporary employees and contractors; everybody gets the same basic orientation as a new hire. Contractors' orientation is based on what job the contractor will be doing — trenching, excavation, electrical, or mechanical. It will be geared more towards these areas.

When I first started here, I asked employees what caused all of the injuries. Everybody always said it was the new employees. That was obviously an area to start with. That's the reason I put new-employee orientation in place.

Now the statistics show it's not the new employees putting people at risk. It's the folks that have worked here usually between one and three years. Maybe as these people have been hired on as fulltime employees, they let their guard down.

That's kind of the focus for me now. How do we reach those individuals?

So we may go back and do a refresher on some health and safety basics.

FAB: Are you the sole person with the responsibility of leading the safety awareness initiatives?

Shankles: In the last three years we've really begun pushing this out to our team leaders and supervisors. We are pushing out training material and allowing the supervisors to review it with team members. It builds ownership with the supervisors.

FAB: Do you mix general safety topics, such as safety tips when working around the house, into your regular safety conversations at the shop?

continued on next page ►

Shankles: Yes. We do try to include topics about home safety. About 80 percent of the injuries that happen to people occur away from work. We do a pretty good job of keeping them safe at work. However, they may be trying more risky tasks at home, and we should focus on this. Unfortunately, this drives everyone's health care costs up.

FAB: Do you think all the time and effort put into keeping PlayCore employees safe has created momentum to keep the initiative alive?

Shankles: I certainly believe that. Our company has acquired other, smaller companies involved in the play and recreation industry. We have companies that build products for swimming pool accessories, climbing walls, bicycle racks, indoor play, park amenities, and fitness equipment. Some of the purchased companies had safety programs already, and we are working to implement it into others that need assistance. We can build additional value for them with our safety program.

FAB: What do you take most pride in during your tenure at PlayCore?

Shankles: People don't get hurt as much, and when injuries occur, they are not as severe as they used to be. It's nice to see people going home safe.

Also, PlayCore is building a reputation in the community as being a good place to work. You don't have to worry about being injured. The employees are showing a lot of buy-in when it comes to safety.

FAB: Do you have any advice for other companies looking to change their safety culture?

Shankles: Jump on board with health and safety and stick with it. It's not something that is a once-and-done thing. It's an everyday thing. It is continuous encouragement of your team to work safe.

One of the other things that really makes me happy is that our productivity has really grown throughout the years. Lean manufacturing has helped us to do that. But it's also helped a great deal with health and safety because making jobs easier also makes folks not have to carry things or transport goods back and forth with wasteful movement.

If I were going to offer advice to other shops, I would encourage them to understand lean manufacturing. That will help your safety efforts.



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DAY 1

30 DAY 1

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How a Fab Shop Earned 24,000 Instagram Followers

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When the company posts things that generate enthusiasm in its sector, employees and other industry professionals like, share, and comment — causing the posts to go out to all of their networks as well. Ultimately this process extends TMC's reach and helps attract new clients and new talent.

"It's not about being salesy," said Vreugdenhil about the process. "It's about showing people this is who we are, and we're having fun doing it."

Why Does Social Media Work?

Your posts demonstrate how your company's values match those who follow you. In Dominico's experience, this shared understanding of the value of online



community creates the feeling of working together as if you are already on the same team. Teammates become very close, and people who communicate regularly online create strong connections. TMC's success in gaining 24,000 Instagram followers, strengthening employee engagement, attracting best-fit talent, keeping skills sharp, and drawing new customers confirms that.

"One of the reasons that TMC has been really successful is that in communicating the things that they stand for on the platforms that they're using, they're telling people something about themselves," Dominico said. "Other people who are already doing those things are able to latch onto it because you're all trying it together."

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