FABTECH Panel Details Development Trends in Additive Manufacturing

Additive manufacturing, more commonly known in the popular vernacular as 3-D printing, continues to be a hot topic in manufacturing, and certainly was one of the areas of interest generating buzz during this year’s FABTECH.

It shouldn’t come as a stunner. 3-D printing materials were identified as one of Gartner’s top 10 strategic technology trends for 2016, and was one of the principal areas discussed during the panel discussion, “Development Trends in Additive Manufacturing and 3-D Printing,” held Thursday morning at the FABTECH Theater.

Here’s what Gartner had to say on the subject as we headed into this year:

Advances in 3-D printing have already enabled 3-D printing to use a wide range of materials, including advanced nickel alloys, carbon fiber, glass, conductive ink, electronics, pharmaceuticals, and biological materials. These innovations are driving user demand, as the practical applications for 3-D printers expand to more sectors, including aerospace, medical, automotive, energy, and the military. The growing range of 3-D-printable materials will drive a compound annual growth rate of 64.1 percent for enterprise 3-D-printer shipments through 2019. These advances will necessitate a rethinking of assembly line and supply chain processes to exploit 3-D printing.

According to David Cearley, vice president and Gartner Fellow, “3-D printing will see a steady expansion over the next 20 years of the materials that can be printed, improvement in the speed with which items can be printed, and emergence of new models to print and assemble composite parts.”

Nothing was discussed at the panel session to dampen this assessment of where additive technology is moving—in a direction determined to have a significant impact on manufacturing practices. The panel of experts at the session included:

- Jennifer Cipolla, Center for Additive Technology Advancement Leader, GE
- Robert Henderson, Director of Additive Manufacturing, Linear Mold & Engineering, Inc.
- Steve Immel, Americas Business Development, Materialise USA
- David Lakatos, Chief Product Officer, Formlabs
- Carl Dekker, President, Met-L-Flo, Inc. (moderator)

The group discussed the technology and materials driving practical solutions and innovations using 3-D printing, noting that a manufacturing environment demanding more customization and faster solutions continues to drive the rapid development of additive manufacturing techniques. Using available and affordable additive manufacturing technologies can increase manufacturing efficiencies of complex products, improve performance, decrease cost and reduce waste; this was the general consensus that emerged during the session.

Prototyping and Beyond

The first industrial applications for additive manufacturing were in rapid prototyping, based on the capabilities of 3-D printing to accelerate product development by cutting the time to design and machine the multiple experimental iterations required for optimizing designs for a complex engineered part or product. While the advantages of rapid prototyping are being felt in all industries, as new 3-D processes and higher performance materials are coming to market, there are...
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Vox Populi: Interviews with Attendees Reveal Ongoing Value of FABTECH

With thousands of people attending this year’s FABTECH, we took to the show floor to find out why they are here. A quartet of interviews with show registrants gives a taste of what “the voice of the people” says about FABTECH.

Chuck Mazoch, President, Coastal Welding Supply Beaumont, Texas

Q: Why are you here at FABTECH this year?
A: We try to attend FABTECH every year. The main reason is to stay on top of technology, and to see the progress in automation and welding and fabrication. We always use that information to help our customers stay on top of what’s going on, and to make sure that their productivity and quality is top notch. If they are successful, we’re successful.

Q: Are you looking for anything particular at the show? Any technology or equipment?
A: Our focus is in automated pipe welding, general metal fabrication, and plasma and laser cutting technology. Those are the big ones for us.

Q: What benefits does attending FABTECH bring to your company?
A: I bring a team of about four people, and it allows us to see all the manufacturers and technologies under one roof. In fact, we can actually do comparative analyses of what this company is doing versus what that one is doing, and why one item might be better to promote than another item. That’s a real benefit.

We also catch up with a lot of people we haven’t seen since last year, or we don’t get to see that often, people we’ve known over the long term in this industry. We get to share stories and experiences and learn from each other.

Denise Johnson, President/Owner, RiteWay Conveyors Lester Prairie, Minnesota

Q: What brings you to the show?
A: I’m at FABTECH this year because it’s such a cool thing to look at all the wonderful, new opportunities to buy equipment.

Q: Any equipment in particular?
A: I am looking at a tube laser, possibly an additional laser, and a press brake.

Q: What are the benefits of attending FABTECH for you and your company?
A: I’ve brought five of my employees so they can see and assess the opportunities of the new products that are coming our way, and think about what we can do to make things better in our business.

I also like networking, especially meeting new vendors that could possibly do new and improved things for us. If I’m always buying the same thing and at the show I see someone who might provide me with the exact same benefit, but maybe with shorter lead times or even a better piece of equipment, that’s always beneficial.

continued on p. 8
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Vox Populi: Interviews with Attendees Reveal Ongoing Value of FABTECH continued from p. 4

Rick Gehman, President, Keystone Koating LLC
Lititz, Pennsylvania

Q: What’s your reason for coming to FABTECH?
A: It’s the largest and most efficient place to get in touch with so many vendors and suppliers in one shot. We do manufacturing and finishing, we are also an OEM, we provide job shop services, and we have three production power gridding lines. So there’s a little bit of everything for us at this show. It’s also a place to see what new technology is out there, what we need to be considering to help our operations, and to connect with other people about how the market is doing and learn some new best practices.

Q: Is there anything in particular you’re looking for this year?
A: One specific thing we’re considering is a jig template or a jig builder. But in general, we’re looking for other tools and resources we can use to improve our business and save time.

Q: What are the benefits of attending the show?
A: The quick answer is to keep in touch with the market and new technology. Another thing is connecting with some of our major suppliers and seeing how things are going—all in one location. Another benefit is getting together with our current network, to talk shop, and find out what’s being said about the market, the industry, and so forth.

Q: What about the value you get personally or as a company?
A: I am bringing two younger gentlemen who are newer, less experienced in manufacturing. It is an opportunity for them to see other resources in the industry and what’s actually going on out there. So it’s a valuable learning experience. For me personally, it’s a maintenance experience. The value is in staying current with the market and not falling behind.

Another value: it’s free to attend with registration; we just pay for our flight and hotel. So it provides a great exposure to the manufacturing industry for a very competitive cost.

Steve Zienka, Special Projects Manager, Welded Tubes, Inc. Orwell, Ohio

Q: Why are you coming to FABTECH?
A: We are always looking to improve, so a big reason is to see the new technology that we could apply to our process, along with benchmarking.

Q: Are you looking for any particular technology?
A: We’re looking at technology that could detect surface defects in line. We’re always looking for things to improve the process, to take out uncertainty and use technology that will tell us if there’s an issue or not.

Q: What do you think are the benefits that FABTECH brings to your company?
A: Besides exposure to the technology, it is networking. I came from a roll manufacturer in the industry, and I now work for a tube manufacturer because of networking. Across the industry, a lot of people know each other and can certainly help each other in many ways.

The show is priceless at times in regards to bringing forward new technology; but it also facilitates the exchange of ideas that we can bring back to our employees and help make us a better company.
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Differentiation through High Performance Innovation: Bystronic Introduces ByStar Fiber 10kW

Innovation is the driver of high performance manufacturing and the key to competitive differentiation. It can be found at the core of every company that desires to compete, survive and flourish. The new high performance ByStar Fiber with 10kW Fiber Laser achieves the competitive differentiation sought by leading edge manufacturers. ByStar Fiber has been designed from the ground up to meet the speed and acceleration demands from high power Fiber lasers.

As Fiber lasers continue to expand to higher power thresholds, one of the key performance factors is the ability to harness the speed benefits from the higher laser power through improved machine performance capabilities. At the core of the improved machine performance is the ability of the motion system to respond without compromises, to the speed requirements from the higher laser power, and the ability of the motion system to maintain its accuracy and rigidity even with changes in direction while cutting at high speeds. To facilitate speed, the ByStar fiber employs a linear drive motion system for both X and Y axes that removes any mechanical limitations from the drive system.

One of the keys to achieving exceptional acceleration dynamics is reducing weight while increasing rigidity. Bystronic's innovative triangle cutting bridge on the new ByStar Fiber provides both. The triangle shape of the cutting bridge enables a 40% increase in acceleration over square profile designs, a 60% increase in torsional rigidity and a 25% reduction in overall profile weight. The triangle cutting bridge design enables the ByStar Fiber to take full advantage of the increased speeds generated by the high fiber laser powers and the linear drives, while maintaining axis rigidity during accelerations.

The innovations continue on the ByStar Fiber with the Detection Eye edge detection camera system that accurately and within seconds, finds the edges of the sheet. The Bystronic ByVision Cutting control interface with 22” full touch screen, intuitively guides the operators through the operation process and since its touch screen interface is like modern smart phones and tablet interfaces, it enables operators to quickly and intuitively learn the control interface. The large front side access door of the ByStar Fiber allows the operators full access to the cutting table from the side.

Harnessing the full laser power and focusing it accurately on to the work piece for each material type is the function of one of the most important elements of a Fiber laser cutting system, the cutting head. The Bystronic engineered cutting head not only has the capability to automatically focus for each material type and thickness, but also regulates the cutting beam diameter. Regulating the size of the focused beam enables the thinner materials to be cut with a narrow beam and the thicker materials to be cut with a wider beam, improving speeds and overall edge finish.

Come and see for yourself why the ByStar Fiber is unrivaled for speed and the key to your competitive differentiation. Bystronic booth C35069.

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- The MaxPulse™ cleaning system delivers 27 percent higher impulse cleaning energy, for increased filtration capacity
- Ultra-Web® fine fiber media technology delivers high-efficiency and longer filter life

Working together, these factors allow the DFE to deliver unsurpassed performance with up to 40 percent fewer filters and a significantly smaller equipment footprint. With this advantage, customers can realize reduced maintenance time and lower overall cost of operation as compared to typical cartridge dust collectors. Each DFE dust collector is backed by Donaldson’s strong technical expertise and support, 24-hour replacement filter shipping and a 10-year warranty.
The LC5 Fiber Laser for Tube & Sheet

is the only fiber laser production machine tool that can process tube and flat sheet, all in one machine. Thanks to its design, switching from tube to sheet is immediate, automatic and does not require retooling. Changeover with the LC5 is fast, making it a production workhorse.

The machine can handle tube up to 334" in length, and 4.75" in diameter. The processing of sheet metal is fully automatic and allows for sheet up to 78" x 236".

Equipped with a fiber laser with power to 5 kW, an automatic pallet changer, independent controls for both tube and sheet—the LC5 is an ideal choice for tube and sheet processing.
“Women of FABTECH” Celebrates the Importance of Women in the Manufacturing Sector

On Thursday morning, FABTECH hosted a networking breakfast celebrating the importance of women in the manufacturing sector. Designed to foster relationships and dialogue between supporters and practitioners in the field, the well-attended event included a continental breakfast and tech tour on the show floor.

While far from a new concept, the idea of recruiting women for manufacturing may not be top of mind when looking to fill the current skills gap manufacturers face. In fact, women represent manufacturing’s largest pool of untapped talent and are a critical component to helping fill this gap. Numerous studies have shown that companies that achieve diversity in management and on their corporate boards attain better financial results, on average, than other companies. According to a Women in Manufacturing (WiM) survey, more than 80 percent of women who do work in the manufacturing industry find their jobs interesting and challenging. Talent development efforts such as increasing STEM education for women, combined with organizations such as WiM and industry events such as FABTECH that support, promote, and inspire women who have chosen a career in manufacturing are important. At the same time, increasing the presence of women in manufacturing helps to create the “push-pull” effort needed to build supply and demand. Bottom line: it’s a win-win situation for the industry.

Keynote speaker for the event was Jennifer Cipolla, Center for Additive Technology Advancement Leader at GE. “This breakfast and tech tour was a wonderful opportunity for women who are in manufacturing to network, discuss what they’re doing, what their companies are working on—basically help each other grow and advance our careers,” said Cipolla.

She spoke at length of her own career and the experience of women at GE. “At GE especially, we stress the importance of having a diverse team,” said Cipolla. “Through diversity, the organization benefits from different perspectives, and a lot of dynamic and engaged conversations occur. At the facility I run, we have a lot of women working in manufacturing. GE in general has always been very strong in furthering the careers of women in manufacturing operations, and we’re always looking to participate in events like this that promote women in the sector.”
PFERDVALUE® - Value at Every Turn

There are a lot of buzzwords that get thrown around in business. One word we hear over and over is “value.” It’s something that can mean different things to different people—but what everyone agrees on is that it’s critical to success and customer satisfaction. At PFERD, value is an everyday goal. With the PFERDVALUE® program, there are a number of ways we can provide value to our customers.

At the most basic level, “value” really means “cost”; customers typically look at cost-per-unit and compare it to like products. But true value lies beyond merely the cost of the product, there are numerous other factors, including:

- **Longevity**: How long a product lasts is as important as its price. If you pay less but have to replace it more often, you’re losing money in the long run.

- **Performance**: No matter the industry or product, it’s important to offer proof of performance and quality objectively. At PFERD, we perform comparative testing which scientifically measures material removal and product loss over a fixed amount of time. When these figures are combined with hourly labor costs and the cost of the product itself, we can calculate an empirical measurement of a product’s impact on overall productivity, and therefore its value.

- **Health and Safety**: As part of the PFERDVALUE® program, our products are designed to focus on the improved health and safety of the operator, an approach we call “PFERDERGONOMICS®.” An important component of value means a happier, healthier workforce. Cost savings are also achieved by reducing worker fatigue, downtime, and workplace injuries that can be caused by excessive noise, vibration, and dust.

- **Time**: Longevity of a product can impact time; As we all know, time is money. Products with longer tool life reduce change-up times, and PFERD’s focus on applications solutions increase the efficiency of processes.

- **Service**: Good service leads to repeat customers and high satisfaction rates, which directly leads to increased value. This is an absolute priority for us at PFERD, and we place great importance on the feedback and happiness of our clients.

Our applications specialists are trained to help end-users choose the right tool for the job. These experts observe real-world processes and operations every day, optimizing them using the ideal product. We aim to dispel the myth that “bigger is always better.” Using a 9” cut-off wheel doesn’t necessarily mean the job will be done faster, better, or more easily than if you were to use a 4-1/2” cut-off wheel. A larger diameter wheel can increase fatigue and danger to the operator, reducing value significantly. To that point, many of our innovative products, including POLIFAN® CURVE flap discs and POLISTAR-TUBE grinding stars, are designed to perform a task with little-to-no secondary finishing time required. Other innovations, such as our quick-change COMBICLICK® system or quick-change adapter for hole saws mean faster tool changes, saving the user time and money. We take a multi-faceted, unique approach to everything we do—and what it all means, in the end, is value at every turn.

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Five Things Manufacturers Need to Know About 3DMP

3D metal printing (3DMP) is the hottest subject throughout manufacturing. This technology is revolutionizing how companies design, test, manufacture and distribute products. With all the hype surrounding 3DMP technology, what are the effects on manufacturers serving key markets for machine metal parts, including aerospace, medical and automotive, and what are the key takeaways?

We have identified five things manufacturers should understand before entering the 3DMP workspace.

1) **3DMP provides the ability to create components that most directly embody and enable true design intent.**

The freedom possible in the manufacturing process allows designers to create optimal designs without restrictions from conventional manufacturing processes. Shown is a metal bracket printed on a 3D Systems laser-sintering direct metal printer.

The freedom possible in the 3DMP process allows designers to create optimal designs without restrictions from conventional manufacturing processes. Design for manufacturability (DFM) has long been the method by which components were designed, and it subsequently drove design standards and practices by which compromises to performance, weight, cost, materials and other factors were necessary to result in a producible part. With additive manufacturing, the restrictions from DFM are greatly eliminated, allowing designers the freedom to create, optimize and push the limits of component development. As a result, designs become lighter, structural capabilities and product durability increase, products perform at higher efficiencies and temperatures, and assemblies are eliminated. All of these results combine to equal lower total cost.

2) **Additive-manufacturing processes need to be fully integrated with EDM, multi-axis CNC, surface finishing and other high-precision machining operations within the confines of traditional manufacturing operations.**

A common misconception is that additive manufacturing will replace or eliminate conventional machining. Although 3DMP allows for the creation of highly advanced, complex designs, it does not necessarily produce end-use features required in many applications.

For example, due to the additive process, the resulting surface finish and tolerances often result in the need to selectively machine certain features. It is critical during the DFM process that the design and manufacturing teams communicate and coordinate activities to produce an additively produced design that is optimized not only for the AM process, but also for the conventional machining required to produce a true end-use component.

The ability of 3D metal printing to build parts directly from feedstock (metal powder, wire, etc.) eliminates the large investment in tooling lead time and cost found with other processes. Early in the development cycle of a product, the manufacturer can produce prototypes and end-use parts with minimal post-processing tooling, which accelerates times to market. Shown is a stainless-steel oil-pump pulley, created on a direct-metal printer.

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3) **Additive Manufacturing reduces barriers to effective low-volume production.**

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Ability to grow and adapt, be motivated and responsive to customers’ needs and wants has propelled us to great levels of success...continuing to do better will make us unstoppable. Our organization is facing a time of many changes and we’re progressively meeting these changes to adapt to the nation-wide and global shifts occurring. The technology evolution in the welding industry is an exciting area in which we will continue our endeavor to meet and bring innovative people together to ensure MK Products remains on the cutting edge.

Our employees and partners have continued to meet the challenges of the welding industry’s growing needs. We all share in the pride of accomplishment and it is with great enthusiasm we look ahead to our future for our industry and for MK Products.

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“The proven performance of SilverPlus makes these electrodes a popular and cost-effective choice since it allows HyperPerformance Plasma owners to cut their electrode and nozzle costs in half,” says Martin Geheran, a consumables product manager at Hypertherm. “These electrodes are a perfect example of Hypertherm’s commitment to lowering the cost of cutting for people who own our products.”

In addition to the new 80 amp electrode introduced today, Hypertherm also offers 130, 200, 260, and 400 amp versions with similar performance. Please contact Hypertherm or an authorized partner to request samples of SilverPlus electrodes.

Hypertherm designs and manufactures advanced cutting products for use in a variety of industries such as shipbuilding, manufacturing, and automotive repair. Its product line includes plasma, laser and waterjet cutting systems, in addition to CNC motion and height controls, CAM nesting software, robotic software, and consumables. Hypertherm systems are trusted for performance and reliability that result in increased productivity and profitability for hundreds of thousands of businesses. The New Hampshire based company’s reputation for cutting innovation dates back nearly 50 years to 1968, with Hypertherm’s invention of water injection plasma cutting. The 100 percent associate owned company, consistently named one of the best places to work in America, has more than 1,400 associates along with operations and partner representation worldwide.
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Five Things Manufacturers Need to Know About 3DMP

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with minimal post-processing tooling, which accelerates time to market. In addition, 3DMP reduces the potentially large investments in casting/forging tooling and numerous machining and transfer fixtures.

As the development cycle transitions from low-rate to high-rate production, the impacts are even more noticeable. Often times in the process of ramping to high-rate production, multiple duplicate tools are required to produce castings, forgings and other raw material sourcing streams. These tools require additional investment and lead times associated with tooling inspection, validation, recurring maintenance and ultimate replacement.

Metal printing is just one manufacturing tool available to the manufacturer, enhancing the entire manufacturing supply chain and allowing for selective utilization of the strong points of each process.

4) Additive manufacturing is not a plug-and-play process.

AM often is portrayed as a process in which a user simply loads a 3D model into the machine, hits the print button, and hours later a finished part is waiting. This portrayal oversimplifies the process and fails to capture the true complexity of additive manufacturing.

Although it is true that the 3D equipment utilizes the 3D model as the primary input to build the desired geometry, several steps lie between creation of the designer's CAD model and achieving a successfully built component. Due to the layer-by-layer build of the component within the 3DMP machine, the designer and manufacturer must consider several factors when preparing a build.

The most notable item is orientation within the build chamber of the machine. This build orientation not only represents the XYZ location of the part, but also the rotation of the part relative to the build plate. Since the part builds layer-by-layer on a flat plane, the manufacturer must understand how those layers will interact and behave during the build process. Sacrificial supports often are added to the design, which play a key role in creating a high-quality, dimensionally accurate product. These supports provide structural stability to mitigate thermal stresses, and help maintain dimensional and metallurgical accuracy. After receiving the CAD model, the manufacturer must determine the optimum orientation to minimize the support structure while optimizing build time and the quantity of parts created within the build.

5) The material capabilities for additive manufacturing are nearly endless.

Every year more and more materials become available for 3DMP, as more products are developed. The process already is capable of producing many of the standard alloys used across industries, including stainless and tool steels, aluminum and titanium alloys, super-nickel alloys and transition metals (gold, copper, tantalum, etc.). These materials result in printed parts that exceed cast properties, and in many cases rival wrought properties.

In addition, the ability to modify the processing parameters with a single 3DMP build provides the manufacturer with the unique ability to tailor material properties throughout the component and further enhances the properties and performance of their product. The impact of 3D metal printing will continue to multiply as the technology continues to advance.

By: Ben Fisk

Ben Fisk is general manager, Methods3D, Sudbury, MA, methodsmachine.com
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So You Want to Buy a Metal Fabricator …

By Tim Heston, Senior Editor, The FABRICATOR magazine

Closing a successful deal involves more than focusing on multiples

It’s been a memorable few years for mergers and acquisitions. Doug Nix, vice chairman at Corporate Finance Associates, Oakville, Ont., Canada, attributes much of this activity to the sheer amount of investment money out there. Of course, the M&A environment can change quickly. What was true a few months ago may not be true today. Regardless, Nix provided a few basic, timeless steps on how a buyer should approach the acquisitions game, no matter what the broader M&A climate is.

As Nix explained, every company has a business model that usually can be broken down into four related components: (1) the customer value proposition, (2) processes, (3) the profit formula, and (4) the resources.

The customer value proposition defines customer value—that is, why customers buy from you. The exact value proposition depends on the company, but Nix categorizes value propositions into two broad categories: service- and price-driven. Fabricators with the service-driven proposition have customers who buy from them ultimately because they value the long-term business relationship; the interactions and knowledge gained from that relationship help drive company profits. Fabricators with the price-driven proposition compete on price and price alone.

He added that the value proposition affects another business model component, the profit formula, but not necessarily in ways many might expect. A company that competes on price alone may have extremely lean, well-polished processes—and, hence, enjoy a healthy profit margin.

The type of value proposition really isn’t about price and quality, which are givens for any successful fabricator these days. Instead, the value proposition drives how people in companies interact with each other, their suppliers, and their customers—what Nix defines as the processes component of the business model.

A company with a price-driven value proposition may switch suppliers frequently and scrutinize internal processes always with the defined goal to keep costs as low as possible, so the company can offer a low price. It still treats customers well, but one underlying understanding pervades business relationships: The fabricator is trying to minimize its costs to keep prices low.

Companies with a service-driven value proposition prioritize long-term business relationships, which people hope will drive profits over the long term. They also scrutinize internal processes to keep costs low—a necessity for survival these days—but the core driver isn’t to allow the company to offer a rock-bottom price; it’s to improve those long-term customer relationships.

Next comes the fourth element of the business model: the resources. These include facilities, people, machines, and other technology the company uses to carry out the processes, which in turn fulfills the customer value proposition and profit formula.

continued on p. 28

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Millennials in Manufacturing
By: Andrew Bader

While manufacturing has evolved dramatically over the last several decades, many young people still do not consider manufacturing a practical career choice. I’m a millennial and, along with my brother, we are the third generation to work for my family’s metalforming company. A newly formed partnership with a customer, cofounded by millennials, demonstrates how my generation can contribute to U.S. manufacturing.

From the modern world where everyone seemingly strives to develop apps, earn “likes” on social media and become the next Mark Zuckerberg, I’d like to introduce you to a young architect out of Chicago named Kyle Hoff. A recent graduate, Hoff quickly ran into a frustrating problem while adjusting to city life. He realized that moving desks and tables from apartment to apartment was not something easily accomplished. So, he designed a solution based on removable furniture legs featuring a unique clamping mechanism. After a successful Kickstarter campaign, he, along with business partner Alex O’Dell, developed, manufactured and shipped their first clamp-on table legs—The Floyd Leg.

A year after the initial release, the newly named company, Floyd, outgrew some of its suppliers and needed additional support to enable continued growth. That’s when our company received an e-mail from Hoff, in search of a metalforming supplier. Hoff and I reviewed Floyd’s designs and were able to make improvements to create a better-looking product, while also reducing costs. Over the next several months we shot videos, conducted conference calls and even texted one another. (Prior to this campaign, I had not once sent a text message to a customer.) Floyd, Detroit, MI (www.floyddetroit.com), is comprised entirely of full-time millennials working in product design, supply-chain management, marketing and customer service, among other disciplines. I’m proud that my fellow millennials have gone beyond the typical modern-day route to success based on developing the next big app, and instead have committed to dreaming up tangible, innovative solutions to problems.

I have enjoyed working with the Floyd team because our partnership is a unique one. We (millennials) have a practical approach to doing business, with a strong focus on contributing to each other’s success. There is something special about helping to turn an idea into products you can touch and hold in your hand. My message to other millennials reading this article: You, too, can get involved in transforming sketches, drawings and ideas into tangible products, ideas that might improve the next airplane, electric car or piece of furniture. Manufacturing provides unique opportunities to limitlessly leverage creativity.

I encourage more young people to get involved, and to realize that there is much more to manufacturing than meets the eye. With today’s technology it can be continued on p. 24.
Pneu-Mech Systems Showcases Finishing Systems, Booth # C46067

Pneu-Mech Systems was established in 1981 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 the founding of Pneu-Mech Systems, we have directed our 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, we are capable of completing “turn-key” projects of most any size. We are a custom manufacturer that builds systems to fit the needs of our customers, and our philosophy is “To deliver to our clients not only our equipment, but our knowledge.” This enables the end users of our equipment to produce both profits and a quality finish.

Pneu-Mech System’s 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 our specialized and custom paint systems from flat metal to finished equipment. Our fabrication staff is highly experienced in the craft of building our systems in modular form to be freighted to our 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 make us the best choice as a supplier. Our installation staff is highly experienced in the mobilization, rigging and placement of specialized finishing systems. We are proud of our staff, highly trained and experienced in the installation and integration of our systems to meet our customer’s needs. Focused on “being easy to do business with”, we provide training, production assistance, troubleshooting and all service work required to install and maintain our systems.

We view ourselves as partners with the clients we serve, and highly value long term relationships. We welcome the opportunity to add you to our rapidly growing list of satisfied customers.

Millennials in Manufacturing

very exciting to learn about subjects such as 3D modeling, robotics, lasers, CNC programming and additive manufacturing.

In this world, where there seems to be an emphasis on digital answers, know that the opportunities to create tangible solutions to real-world problems are almost endless, and will be here forever.

Andrew Bader works in marketing and sales for OGS Industries, Akron, OH; ogsindustries.com.

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McDantim Inc.’s TMA950-3 gas blending system can provide up to 950 scfh of a three-component gas blend. Accurate mixtures of any three of the following gases; Ar, N2, CO2, O2, He, or H2 can be produced on-site in the exact ratios required. McDantim Inc. guarantees +/- 10% (of the minor component) accuracy at any flow rate from 1-950 scfh. Like all its gas blending systems, the TMA950-3 requires no electrical connections, buffer tanks, or ongoing maintenance and the tamper-proof design ensures that well-intentioned welders can’t change the blend ratios. Systems that can provide up to 4000 scfh are readily available.

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Benefits Of Online Data Management Systems

ESAB WeldCloud™ and CutCloud™ automate functions once performed manually to save countless hours, provide real transparency into the drivers of productivity, quality and cost control.

Because web-based reporting speeds information flow, companies obtain a clearer picture of plant operation. They can eliminate equipment downtime, unscheduled maintenance and process bottlenecks, as well as improve overall equipment effectiveness, speed up time to market and streamline schedules.

In metal fabrication, users of ESAB cutting systems equipped with Vision Series controls — such as the SGX and Combi-rex — can gain all the benefits associated with ESAB’s Data Leap CutCloud and CutCloud. With these systems, you can:

• Monitor manufacturing performance of machines automatically.
• Link data to scheduled order and part data for full traceability on material and parts.
• Automatically program or set up a part based on a scanned code.
• Transfer data automatically (instead of manually inputting information into production processes and record results) and automatically generate higher quality reports.
• Make real-time responses to production floor activities statistics.
• Fully integrate nesting, cutting and ERP systems with automatic data transfer of order data and production status.

Powerful Tools

With the ability to measure, store and analyze up to 7.5 million weld sessions per day, online data management systems such as ESAB’s WeldCloud™ provides tools that enable managers to make quantifiable leaps in productivity, quality and cost control.

To showcase the power of online data management tools, let’s take a hypothetical case of a fabricator with 20 welding stations in Houston and another 20 in Seattle. To start, the welding engineer uses WeldCloud to push out the new weld procedure to each system. Then, operators scan their badge to verify that they have the required certifications. After scanning a code on the blueprints for the part at hand, WeldCloud automatically pulls in the appropriate weld schedules and acceptable limits. Operator also scan codes for the raw materials, gas cylinder and wire spool for lot traceability.

By identifying the exact source of the defect/reject, companies can rectify the situation faster. With WeldCloud, managers can generate reports in seconds and reduce paper use and associated storage space.

During welding, WeldCloud captures arc-on time and welding parameters. If at any point the system detects an error, incomplete data or parameters that are widely out of tolerance, it can create an alarm and even prevent the operator from striking an arc.

Alerts can also include the system automatically sending an email to the welding supply distributor when consumables have run low, as well as text messages to alert the maintenance team that it’s time to replace worn consumables.

For a large enterprise, managers can look at data for each weld system, groups of systems, by facility or enterprise wide. Because web-based reporting speeds information flow, companies obtain a clearer picture of plant operation. While results vary, companies who deploy cloud-based solutions often experience significant ROI in six to 12 months.

So You Want to Buy a Metal Fabricator... continued from p. 22

Nix divides buying into four stages: strategize, search, structure the deal (including valuation), and integrate. The strategy defines why a company wants to acquire a business, which in turn drives which business it acquires (the search), how much it is willing to pay (valuation), and how the new business integrates with the existing enterprise. Once a company establishes its strategy, it moves forward with a search.

The better a seller can help a buyer achieve its strategy, the more the buyer may be willing to pay.

When looking at companies for sale, buyers analyze the business model components: customer value proposition, processes, profit formula, and resources. The first three determine how well a new business can integrate into the whole.

Nix added that misconceptions about integrating one company into another... continued on p. 30
THE RULES, DEMOLISHED.

ESAB’s breakthrough 2017 releases are here and redefining what’s possible in welding and cutting. Consider yourself warned, and head to booth N4529 for a chance to win a machine a day.

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FABTECH Panel Details Development Trends in Additive Manufacturing
continued from p. 1

more possibilities for them to replace existing commercial production processes.

“The benefits of additive manufacturing are the geometries that it allows you to build that, in a sense, can’t be built any other way,” said Henderson. “One of the major benefits of additive manufacturing for metal parts is that there is no tooling. You don’t need a mold or a dye or any kind of core. You just need a computer program, and what I call a digital tread. You need the digital tread to make the part.”

Another key advantage of additive manufacturing is the ability to integrate multiple parts into a single piece. “We have some components that we manufacture with 3-D printing that were four- or five-piece assemblies,” noted Henderson. “In fact, I have one that was almost a 100-piece assembly that we printed in a single piece. There is a maxim in engineering that says if you add a part, you add a problem, so we get rid of reliability problems down the road by making things in one piece.”

Dekker detailed some use cases where additive manufacturing is being used for jigs, fixtures, and templates, as well as tooling setups and evaluation pieces.

The Importance of Education and Due Diligence

According to Dekker, one of the key takeaways of the panel presentation was the importance of education in the application of additive manufacturing technologies. “There are numerous processes involved, not to mention numerous manufacturers of additive technology. So making sure that you understand where the strengths and weaknesses are for each different process as you apply it to your products and components is critical to achieving the desired results,” he said. “Being aware of the technology specialization per application is key.”

He also cautioned manufacturers who are incorporating additive technologies into their processes to be diligent in validating the claims of the technology they’re acquiring. “I’m not trying to say that the salespeople are just selling stuff,” explained Dekker. “Some of them have just not been trained. They’re not hands on; their objective is to go out and find opportunities, not to apply the technology and make parts. They may not be aware of the specific things that will make your application successful.”

According to Dekker, if a company hasn’t researched and validated the technology being implemented, they could be looking at a series of additional expenses to get a usable end product. “When you start looking at that situation, you may be looking at literally a 2x factor or close to it on the cost of the equipment to be able to get it running for your specific needs,” he noted.

Corporate Leadership and More

Cipolla spoke about what GE is doing specifically to advance additive manufacturing. Her center is part of GE corporate, and helps with advancing additive manufacturing technology across the enterprise.

“We work very closely with the other GE businesses and develop production-grade products using the additive technology,” she explained. “How we help industrialize that process and help the product come to market sooner is at the core of what we do.”

The session closed with an array of questions from audience members on issues such as expanding material sets, lightweighting designs, and finishing time associated with 3-D-printed parts.

“Their processes to be diligent in validating the claims of the technology they’re acquiring,” concluded Henderson. “I think this session has tried to leave the audience with a basic idea of the steps and thought processes involved in applying the 3-D printing process, as well as underscoring the importance of guaranteeing quality. We hope we have accomplished that, as well as pointing towards the state of the art of 3-D printing in manufacturing at this time.”
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