

## Keynote Outlines Fourth Industrial Revolution Impacts

In her Wednesday morning keynote presentation, Karen Kerr, Director of Advanced Manufacturing for GE Ventures, provided a packed FABTECH Theater audience with her unique perspective on a range of advanced manufacturing techniques and their impact on creativity and entrepreneurship.

Titled "Innovation and the Future of Work in Advanced Manufacturing," Kerr's vision included a "redefinition" of the competitive landscape in multiple sectors, with far-reaching implications that will have impact on international trade patterns and the distribution of global growth. In addition, she provided myriad concrete examples of direct impact on everyone's daily lives through major advances in areas like healthcare, energy, and transportation.

"We really are in the midst of what many are calling a Fourth Industrial Revolution," Kerr asserted, outlining an initial revolution driven by steam power and mechanization, a second driven by electrification and the assembly line, and a third driven by information technologies.

"In the Third Industrial Revolution we had programmable logic computers controlling machines in our factories," she explained. "It was digital, but it was discrete. In this Fourth Industrial Revolution we are now able to leverage



Karen Kerr

the power of the Internet and the Cloud to connect our machines and to leverage large data – big data coming from network sensors, to more intelligently drive outcomes."

She supported the view with some direct examples of what is being accomplished through these intelligent connections.

In GE's new jet engines, for example, she pointed to the collection of "a terabyte of data per day on their operations," with the subsequent mining of that data and leveraging those results "to optimize climb, how planes use auxiliary power, and how they leverage the engines when they are taxiing."

"What that allows customers of ours, like Asian Airlines, to do is to save one percent on fuel per

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## Panel Highlights Advanced Manufacturing

Wednesday's State of the Industry Executive Outlook panel provided FABTECH attendees with an opportunity to hear from a carefully assembled selection of industry leaders who shared their experiences and perspectives on the future of advanced manufacturing.

One of the key questions offered by moderator Rebecca R. Taylor, Senior Vice President for the National Center for Manufacturing Sciences asked panelists to clarify their definitions of advanced

manufacturing and how it relates to traditional processes.

"Advanced manufacturing is really just a combination of some advancements and some traditional methods," offered Robert Henderson, Director of Additive Manufacturing for Linear Mold & Engineering, Inc. "We have CNC machines and I tell the owner of our company all the time, 'We only have two problems: We don't add enough on the additive side and we subtract too much on the subtractive side.' You really need to fit the advanced manufacturing into

something you're doing."

He offered the example of customers that integrate two or three parts into one part, which is then manufactured through additive processes and which is then conventionally machined or conventionally heat-treated.

"So advanced manufacturing may have one leap forward out of 32 different processes that you do," he added.

"Advanced manufacturing covers the full realm," echoed Tom



McGaughy, Director of Technology for EWI. "But sometimes it can just be the integration of two existing technologies that weren't integrated in the past."

He supported the assertion with the example of combining

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# American Welding Society and WEMCO Honor TV Host Mike Rowe with 2015 Excellence in Welding Award

The American Welding Society (AWS) and WEMCO, an Association of Welding Manufacturers, and a standing committee of AWS, have honored TV host Mike Rowe, with a 2015 Excellence in Welding Award in the exceptional category.

The Excellence in Welding Awards are given out in 10 categories and honor individuals and companies who make a powerful impact in their communities. The exceptional category is a special recognition given by the WEMCO Executive Committee to a person who goes above and beyond to promote

welding and the skilled trades industries. Rowe is the first ever recipient of an Excellence in Welding Award in the exceptional category.

Best known as the “dirtiest man on TV” a title he earned while hosting Discover Channel’s Dirty Jobs, Rowe is currently in production for his show Somebody’s Gotta Do It on CNN, in which he introduces viewers to innovators, do-gooders, entrepreneurs, collectors and fanatics with unique jobs that aren’t the most glamourous but make civilized life possible.

Rowe also founded The mikeroweWorks Foundation, a



public charity that awards work ethic scholarships to students pursuing a career in the skilled trades. To date, The mikeroweWorks Foundation has awarded more than \$3 million in scholarships across the country in support of closing the country’s skills gap. As a strong supporter of the trades, Rowe often serves as a spokesperson for issues related to the skills gap, the aging workforce, and the meaning of a good job.

“The entertainment industry loves to give out awards, and I’ve been honored with several in the past. But for me, the awards that matter most are the ones like this.

To be recognized by AWS is better than gratifying. It’s humbling. Because fundamentally, it’s a privilege to speak on behalf of some many good jobs that actually exist, and help shine a light on so many great opportunities. I’m flattered, and very proud to accept this award on behalf of everyone at mikeroweWorks, thanks!” ■

*The remaining 2015 Excellence in Welding Award winners were announced yesterday Wednesday, November 11, 2015 at a special luncheon during FABTECH.*



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## Did You Know?



More than 500 new products debut at FABTECH 2015. Refer to the Official Show Directory, New Product section for a list of new products on display by exhibitor name and technology. Or, look for the New Product Lightbulb decal in front of those exhibitors showcasing new products.



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# Miller Electric Manufacturing Company Debuts New Products

Miller Electric Manufacturing Company is a leading worldwide manufacturer of arc welding and plasma cutting equipment and related systems for metalworking, maintenance and other applications. As a FABTECH attendee, this week is your chance to see an array of innovation that Miller Electric offers. Stop by booths N11037 and N14037 to find out more!

## Continuum™ Advanced Industrial Welding Systems



Designed to provide exceptional arc performance, these next generation of advanced MIG welding systems help welding operators of all skill levels to create quality welds on thick or thin materials. User-friendly controls and system flexibilities help manage challenging jobs. The addition of welding information management collects and reports weld data to improve productivity and manage costs.

## Big Blue® 800 Duo Pro SF Welder/Generator

Multiprocess welder/generator runs conventional stick, TIG, FCAW and MIG welding, as well as advanced Regulated Metal Deposition (RMD®) and Pulsed MIG processes with the addition of the FieldPro Smart Feeder. These advanced processes can operate up to 200 feet away from the power source with no control cable, help to reduce weld failures, and can eliminate backing gas on some stainless and chrome-moly pipe welding applications.



## Weld-Mask™ Auto-Darkening Goggles

An extreme low-profile design allows welding operators access into spaces where the use of a traditional welding helmet would be limited. This Miller-exclusive design is usable for gas welding and cutting, as well as light-duty MIG, TIG and Stick welding. It is ideal for maintenance, repair and installation applications, and specialized welding applications where alternative welding protection is needed due to space constraints.



## ArcReach™ Multiprocess Welding System



Designed to reduce downtime, costs and exposure to safety hazards by allowing welding operators to set voltage at the weld joint without the use of control cables. This capability helps improve productivity by eliminating unnecessary trips to the power source and providing greater arc-on time; encourages best-practice weld settings and techniques; and reduces tripping hazards and operator fatigue caused by excessive walking to and from the power source.

## Insight Core™ and Insight Centerpoint™



Included on an expanded offering of Miller power sources to provide weld data to drive continuous improvements. These systems collect and monitor data to help increase productivity, improve weld quality and manage cost.

## Digital Infinity™ Series welding helmets



Include a 13.4 square inch viewing area — the largest in the industry — to provide an unsurpassed view and eliminate tunnel vision. New headgear with oversized comfort cushion provides extensive adjustability, settings and improved support, while the integration of Info-Track™ lens technology tracks and displays arc time, and allows the operator to set the time, alarm and timer. Available graphic options include Black, Stars & Stripes™, Camouflage and Departed™.

## Dynasty® 210 TIG and Stick Welding System



Provides exceptional TIG and stick welding in an easy-to-use, versatile and portable machine. The system offers

easy software updates and feature expansions, as well as improved welding performance on aluminum (DX model only). Wireless remote control compatibility helps save time and money by eliminating cord tangles or failures and provides precise welding operator control.

## LPR 100 Half Mask



Expanded options to this low profile reusable respirator include a wrap-around spark guard that protects filters from spatter and other debris, combination P100/Nuisance Level OV Relief filters and new medium/large size offerings. The pleated filter design on the LPR-100 half mask respirator provides additional surface area for maximum efficiency and filter life, with exclusive filter media that maintains efficiency in both humid and non-humid environments.



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# Networking and More at FABTECH Industry Night

**I**t was an evening of laid-back networking on Tuesday night when several hundred FABTECH exhibitors and attendees congregated at downtown Chicago's Lucky Strike Lanes for FABTECH's Industry Night. The ticketed event provided a unique opportunity to relax and unwind over food, drinks, bowling, and billiards.

The atmosphere allowed exhibitors and attendees to discuss business opportunities and solve problems in a low pressure environment.

The venue welcomed the group with an "industrial chic" vibe punctuated by alley-length super nachos tables, myriad Chicago pizza options, burgers, chicken, beef, and a wait staff hustling trays of vegetables and desserts.

One of the unique features of the fun-filled evening was a special appearance by Jeanette Lee, the famous "Black Widow" professional pool player.

Following a half hour trick shot performance demonstration, the Jeanette Lee Billiard Challenge placed a spotlight on the table abilities of several members of the FABTECH crowd who attempted to duplicate some of the trick shot success.

More than an hour later, Jeff Wilson, director of new business development for Cleveland-based Anchor Manufacturing Group, Inc., was still smiling over his challenge success. Holding up a large photo and cue ball that were both signed by Lee, he explained, "I had to make a trick shot that involved getting four balls in pockets with one shot. She set it up, but I was the only one who did it."

Along with Wilson's treasured prize, several other autographed cue balls were distributed to happy winners during an end-of-evening raffle.

While much of the crowd was focused on the pool tables, another slice of the audience was relaxing on the 16 adjoining bowling lanes, where an "evening high score" of

195 – "That's with house shoes and a house ball and you know how hard that is" – was dethroned at the last minute by a score of 211 turned in by "Colleen from Oregon."



*Jeff Wilson prepares to take his trick shot at Industry Night*



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## Attendees Maintain Exploratory Goals

**A**s FABTECH progressed through the week, the show floor and concourse continued to bustle with attendees seeking to network, learn about the industry and find solutions to technology and manufacturing process questions.

**PETER FOSS** is vice president of sales and marketing at Polymics, a small company based in State College, Pennsylvania.

Just arriving today, Foss said, "I'm trying to get a better understanding of the industry. It's good to see some of the equipment first-hand."

Foss said that attending FABTECH last year was beneficial to his grasp of the manufacturing arena and that he would like to be able to spend more time exploring and learning at the show. He's also perceived that the show is growing. "I think next year I'll spend two or three days, because I'm not going to see all that I want to see today," he said.

**SCARLET BURMEISTER** is a welding instructor at Chicago Women in Trades, a non-profit organization promoting the participation of women who want

to learn about and build careers in the construction industry. She was attending FABTECH with five of her students, marking her first visit to the show. "I brought my students to FABTECH so they can experience more of the metalworking industry and to see different machinery and processes, just how many people are involved with it, how big it actually is and all the possibilities there are out there once they go to work," said Burmeister, who has been a welding instructor for a year and a half.

When asked what her goal is for her students' experience at



FABTECH, she said, "I hope that they learn that welding and metalworking isn't necessarily just standing in a lonesome booth all day long, and also that there are a lot of things that they will learn outside of the class, like bending and different processes. I also hope they learn how immense the metalworking industry is, and that if they aren't challenged, they can find challenges."

**SHENIQUA CLEVELAND** is one of Burmeister's welding students at Chicago Women in Trades, and has been in the program only six weeks. "I love it," she said. "It's something new. It's different from my past experiences with work. I like the beauty of how things look after they're welded, and the different techniques and the different things that we use."

Her goal for attending FABTECH, she said, is to obtain



Sheniqua Cleveland, Scarlet Burmeister

"more knowledge about welding - things that I haven't learned or heard in class yet," and to discover even more about the possibilities for the future. "I know I will," she added.

**MATT DEPLARIS**, engineer with S & C Electric in Chicago, said he had multiple reasons for his attendance at FABTECH. "Networking is probably the biggest; putting faces to the names," he said. "I'm a new employee to the company, so this gives me an opportunity to build some relationships with some of the vendors that we use." He added that more than 40 coworkers are also attending during the week, a luxury of being located in close proximity.

Having attended FABTECH last year, Deplaris said he found it very beneficial and provided multiple networking opportunities, and, he added, "we also found some pretty innovative solutions for some of the manufacturing challenges we had at my previous employer."



Matt Deplaris

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# TRUMPF Demonstrates Products and Features that Boost Your Business

**T**RUMPF products making their North American debut at FABTECH 2015 include: the TruBend Center 5000 enabling bend geometries not possible with a traditional panel bender, the TruLaser 2030 fiber with LiftMaster Shuttle offering a variety of flexible integrated automation options, the new TruPunch 5000 with SheetMaster, and TruTops Boost software featuring all-in-one design and programming. Learn about features that "Boost" productivity and efficiency, like Drop&Cut for intuitive processing of remnants and Smart Punch Monitoring that automatically detects a broken punch. Experience Industry 4.0 and how it can impact your profitability today and tomorrow.

The TruLaser 2030 fiber with new LiftMaster Shuttle will be on display at the TRUMPF booth S1701. Featured with the energy-efficient fully integrated 4kW TruDisk laser, the TruLaser 2030 fiber offers flexible and economic laser processing across a variety of materials and thicknesses. With a 60 inch x 120 inch working range, optimum energy efficiency, and minimal space requirements, it is highly suitable for job shops that run up to three shifts per day as well as for first-time laser users looking

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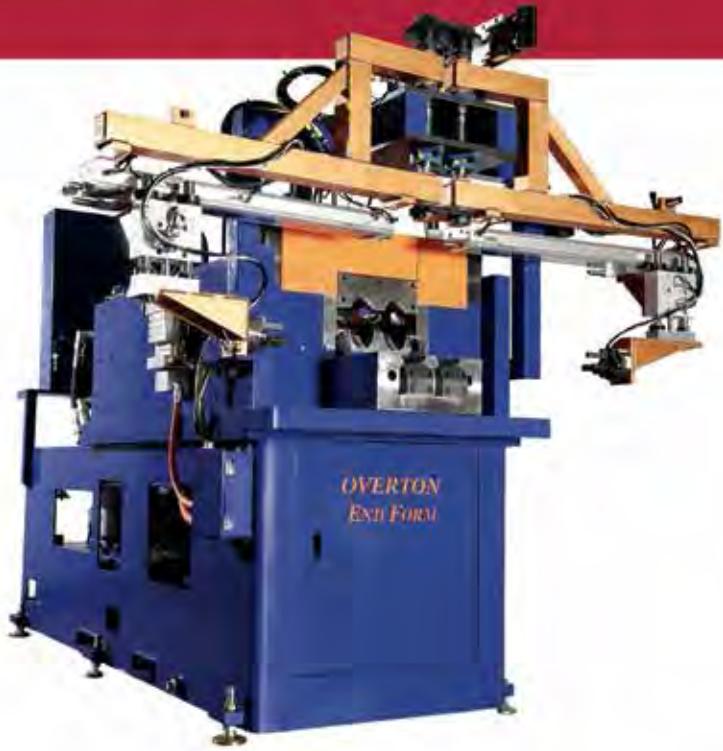
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## 3D/ADDITIVE MANUFACTURING PAVILION IN THE GRAND CONCOURSE

Don't miss the exciting 3D/Additive Manufacturing Pavilion in the Grand Concourse. Attendees can see live equipment and products on display from a host of exhibitors and check out the FABTECH Lion Project. This unique project was a collaboration between the Art Institute of Chicago, Exact Metrology, Met L Flo and Linear Mold & Engineering, Inc. to produce miniature replicas of the iconic lions that flank the museum using 3D/Additive technology.

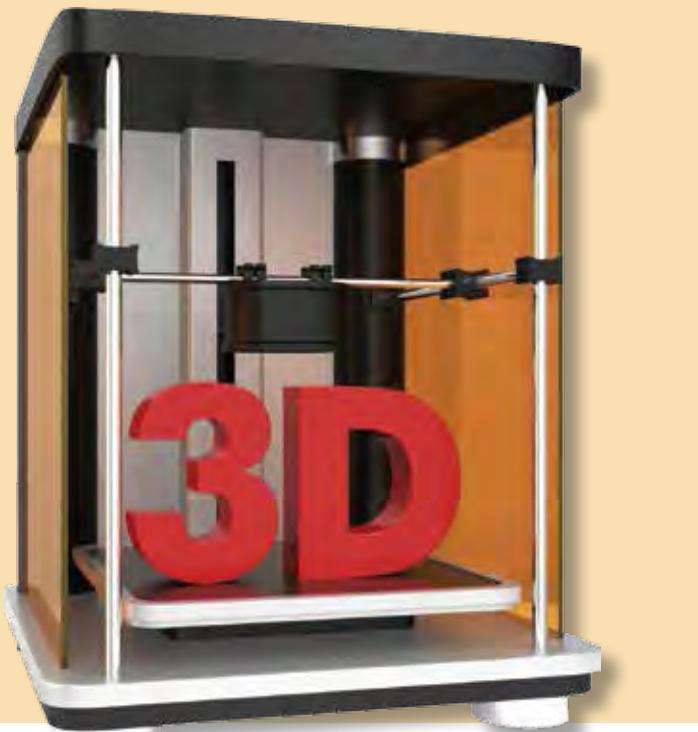
An array of additive-made parts will be also be on display from these FABTECH exhibitors:

Cincinnati Inc., Booth N9000

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- Great performance with metallic and special powders
- Highest transfer efficiency with any powder
- Best color change speed and flexibility
- Compact modular footprint



# Amada's LCG 3015 AJ — Fiber Laser + MPL Automation



The LCG 3015 AJ is a high-speed and high-precision fiber laser cutting system that uses approximately a third of the electricity required by the same wattage CO<sub>2</sub> laser system. Available as 2kW, 4kW or 6kW, the LCG 3015 AJ was developed with Amada's proven fiber laser technology. This technology helps achieve Process Range Expansion (PRE) by providing the ability to cut brass, copper and titanium. The LCG 3015 AJ is a true flying optic laser system. The material remains stationary as the cutting head moves on all three axes (X, Y & Z) to process the sheet. This translates into increased productivity and increased accuracy at higher cutting speeds. The LCG 3015 AJ is built to adapt to the evolving production environment of manufacturers. The cutting head is propelled by a highly-dynamic motion system that achieves the acceleration and rapid traverse speeds of more expensive linear drive motion systems.

The LCG AJ uses approximately a third of the electricity required by the same wattage CO<sub>2</sub> laser system. It is also three times more efficient with the electricity it does utilize, reducing costs and providing a more environmentally-friendly laser system. The LCG AJ does not require laser gas, mirrors, or any other items typically associated with generating a CO<sub>2</sub> laser beam. A single fiber optic delivery cable eliminates the need for additional external mirrors. The result is significantly less operating costs and maintenance.

## Standard Features

- Includes a full enclosure that surrounds the entire cutting area with access for part removal
- Utilizes a helical rack and pinion drive system for both the X and Y axes, while the Z-axis is equipped with a high-precision ball screw
- Specifically designed to handle high-speed operation, the LCG AJ is also engineered to maximize safety with a sectionalized dust collection system
- AMNC/PC touchscreen control with intuitive graphic display and 50% faster processing speed
- A high-speed cutting head with increased sensing speed for faster cutting and plasma resistance in thin materials
- Engineered for simplified setup, the lens and nozzle can be easily removed and installed without tools, wires or air lines

With an innovative motion system and advanced structural design, the LCG 3015 AJ represents an optimal balance of cut speed, positioning acceleration and overall accuracy. To realize full machine potential, Amada offers a variety of modular automation options that let you configure your system according to your specific operational needs. One example, the MPL, is an economical system that provides fast and efficient loading/unloading in a small footprint.

Designed and built at Amada's Brea, CA facility, the MPL is ideal for fabricators who need a basic load/unload system. This high-speed automation system utilizes a single raw material pallet and a single offload pallet. The unit is positioned directly above the shuttle tables, minimizing the amount of floor space required. Since the system uses a single raw material pallet, there is no tower — making the MP-L the ideal solution for environments with low ceilings. ■

*Stop by booth #S901 to find out more about the LCG 3015 AJ and the full range of innovation offered by Amada.*



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60 ton workshop press

100 ton - \$9,900 • 30 ton - \$6,700

Prices valid November 9–12, 2015. Subject to prior sale.

# EDUCATION PROGRAM

## THURSDAY, NOVEMBER 12

## SCHEDULE-AT-A-GLANCE

TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3:30 PM
FINISHING	C100: FINISHING Spray Painting Workshop <b>B</b> 8:00 AM - 12:00 PM - \$299 for members and \$349 for non-members Room S404A		
LEAN	F101: <b>NEW!</b> Lean Tools for Sustainable Operations <b>B</b> Room S403B		
JOB SHOP SOLUTIONS	F104: <b>NEW!</b> Making a Business Case for Safety <b>B</b> Room S503A		
FORMING & FABRICATING	F106: Making Flat Parts: Leveling Solutions <b>B</b> Room S402BC		
WELDING			
SEMINARS	W23 Welding of Stainless Steel (Avoiding Weld Defects) • Room N129 ..... 8:30 AM - 4:30 PM W25 Metallurgy Applied to Everyday Welding • Room N227B ..... 8:00 AM - 3:00 PM		
RWMA SCHOOL	W29 RWMA Resistance Welding School – Day 2 • Room N227A ..... 8:00 AM - 4:30 PM		
PROFESSIONAL PROGRAM	W33: Session 16: Mechanical Properties • Room N138 ..... 8:00 AM - 12:30 PM Session 17: Advanced Joining Technologies • Room N139 ..... 8:00 AM - 12:30 PM Session 18: Ferritic Alloys (Professor John C. Lippold Symposium) • Room N140 ..... 8:00 AM - 12:30 PM		
SPECIAL PROGRAMS	AWS Certification Exam ( <i>advance application required</i> ) • Room N228 ..... 7:00 AM - 6:00 PM Thermal Spray Wire Arc Demonstration (Hourly) – Day 4 ..... 9:00 AM - 3:00 PM		

AWS Headquarters, Room N229

FABTECH Headquarters (FMA, SME, PMA, CCAI), Room S402A

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# Amada's HG 1003 ARs — Automated Bending + Robotics



Amada's new HG 1003 ARs utilizes the combined forces of an ultra-precise press brake and a 6-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 6-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, an 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. ■

*Stop by booth #S901 to find out more about the HG 1003 ARs and the full range of innovation offered by Amada.*

# Lincoln Electric Introduces the UltraCore® HD Marine

This new FCAW-G wire electrode is designed to provide a flat bead shape and high deposition rates in any position using inexpensive 100% CO<sub>2</sub> shielding gas. UltraCore HD Marine welds exhibit decreased spatter levels and low fume generation rates over previous wires. This electrode meets applicable shipbuilding codes and standards, including ABS, DNV, LR and BV. UltraCore HD Marine, like other UltraCore wires suitable for shipbuilding applications, is wound on 8 in. 15 lb. spools for easy handling and compact wire feeder compatibility.

The Lincoln Electric Company, headquartered in Cleveland, Ohio, is the world leader in the design, development and manufacture of arc welding products, robotic arc welding systems, fume control systems, plasma and oxyfuel cutting equipment and has a leading global position in the brazing and soldering alloys market. Visit booths N11021 and N11015 to view welding and cutting demonstrations, gather cost reduction ideas, ask application questions and see the latest in fabrication equipment, welding consumables, automation, cutting systems, software and welder training systems. ■

THE PREFERRED SHIPBUILDING FCAW-G ELECTRODE

UltraCore® HD Marine

# Welding and Cutting Products Set New Standards for Productivity, Performance

ESAB welding and cutting products and system solutions set new standards for productivity, reliability, durability, portability, and flexibility. With one of the most diverse offerings in the industry, ESAB can address any welding and cutting requirement. At FABTECH booth N6074, ESAB showcases a broad scope of products and solutions – all designed to improve performance and lower the cost of operation.

# New Game-changing Multi-process Welder

The Rebel™ EMP 215ic is a welding system that offers true multi-process arc performance, 120V/230V primary input power flexibility, lightweight portability, a groundbreaking operator interface and exclusive sMIG (“smart MIG”) technology that learns and adapts to the operator’s technique. Rebel’s breakthrough design was inspired by professional welders and combines versatility, performance and ease of use in the best go-anywhere weld-anything machine on the market today. Dare to rebel – experience Rebel at FABTECH!

## New WeldCloud™ Data Management Platform Allows Continuous Improvement

The WeldCloud software platform captures and analyzes data so users can maximize asset utilization, improve documentation and QA processes, and monitor and drive machine/operator productivity. Secure, robust and scalable, WeldCloud operates within a user's firewalls, automatically transmitting and storing data from power sources via Wi-Fi or cellular network. WeldCloud can be customized to fit application needs and integrates with ESAB's DataLeap solution for end-to-end traceability from cutting to welding. See WeldCloud in action at FABTECH.

## Complete, High Productivity Automated Welding Systems

ESAB welding automation solutions put high quality, high capacity, and much higher productivity within reach. At FABTECH, see a complete state-of-the-art robotic cell featuring the new Aristo® power source combined with ESAB's unique tandem Swift Arc Transfer (SAT™) MIG welding process for travel speeds well beyond the limits of normal spray arc welding. Also on display, an automated Column & Boom system featuring the innovative ICE™ process for SAW. ICE exploits the excess heat from the Twin SAW process to melt an additional non-powered welding electrode, doubling the productivity of most SAW applications.

## Manual Plasma Cutters Offer True Performance, True Cut Capacity

Master the art of manual cutting with the Thermal Dynamics® Cutmaster® TRUE™ series of hand-held plasma cutters. With the TRUE series, the recommended cut capacity is the true cut capacity, so there's no need to "buy up" to a larger system. A recommended cut has a smooth

cut face with little or no dross and requires little or no rework or grinding – all of which improve productivity and quality.

## Cutting Automation Solutions for Every Shop

ESAB has a cutting automation solution for every process: plasma, oxy-fuel, waterjet and laser cutting. The Crossbow is the perfect entry point into automated plasma or oxy-fuel cutting, featuring a fully-integrated CNC in a compact, portable system. SGX is a plasma/oxy-fuel system designed for performance, speed and accuracy and engineered for easy operation. Experience these systems and Columbus® CAD/CAM programming/nesting software and advanced DataLeap production management software at FABTECH.

## Premium-quality Filler Metals Optimize Performance

ESAB continues to set the standard in filler metals with premium-quality wires and rods for everyday welding, as well as solutions that increase productivity, meet stringent code requirements and deliver specialized properties for specific applications. Learn how ESAB filler metals can help increase productivity, lower total cost of ownership and improve the welding experience. On display at FABTECH, new Stody® nickel-based tungsten carbide hardfacing wires, new Stody all-position CO<sub>2</sub> Flux-Cored nickel super alloy wire, and more.

Visit ESAB at FABTECH booth N6074  
or learn more at [esab.com/fabtech2015](http://esab.com/fabtech2015).





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# Tube End Squaring for High-Purity Welding

Autogenous welding (fusion welding without the use of filler metal) is used for most high-purity and sanitary tubing systems. These systems require very high quality weld joints, with emphasis placed on obtaining a smooth inside surface to avoid contaminant traps.

Stainless steel, such as 316L, is used to provide corrosion resistance against attack by the process chemicals or the cleaning procedures. Most of the tubing is mechanically polished and/or electro-polished to obtain a clean, smooth inside diameter (ID) suitable for the application.

## Ultimately, to achieve quality autogenous welds, end preparations must be:

- Flat
- Square to the run of the tube
- Cut with zero-degree bevel angle
- Burr free, or with a minimal burr to allow consumption by the welding procedure



### In addition:

1. Flatness should be within .0003" (.008mm) for a maximum gap of .0006" (.015mm) when two ends are fitted for welding.
2. Squareness should be within .002" (.05mm) per diameter inch or 1/10 degree as measured from within two to four diameters of the end.
3. Significant out-of-squareness can cause poor fit-ups, forcing the use of cold springing to make the final joints, or, in the case of automatic tube welding, alignment clamps can pull the joint apart on one side.

4. Bevel angle should be zero degrees plus or minus 1/4 degree. With a .065" (1.65mm) wall thickness tubing, the maximum gap either on the ID or the outside diameter (OD) would be .0006" (.0015mm).

5. Allowable burr depends on the welding procedure and the specific application requirements.

When it is not permissible to touch or mark the surface of the tube in any way, the burr must not exceed the amount that the welding procedure can consume and not cause drop-through or require excessive HAZ-causing heat on either side of the weld joint. Generally, the burr must be less than .010" (.25mm) per side on the inside or outside of the tube wall.

It is possible to cut or sever tubing to length with a cutting/severing system if burr-free end conditions and surface finish on the ends are not critical. With cutting or severing operations, the cut must be made from the OD of the tubing. As a consequence, some burr is pushed

ahead of the cutting tools, leaving a burr on the ID of the tube. The burr can be minimized, but not eliminated, with specially designed tool bits and speed and feed adjustments relative to the material.

Dedicated portable or bench tools which mount with OD collets on open-ended tube and address the tube with axially-fed tool bits are capable of meeting the tolerance defined for optimum autogenous weld end preparations on almost all tubing materials. Tubing materials and surface treatments change the cutting characteristics. Therefore, tool bits, feeds, and speeds must match the material to obtain optimum end surface finishes, burr-free conditions, and tool bit life. ■

*For more tube squaring information, or to see Tri Tool's new Model 301.5SP Tube Squarer visit Booth N24041 or at tritool.com*

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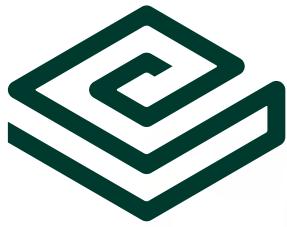
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# SCRAPE-N-BURR Passes Welders' Tests — Again and Again

**W**hich industrial welding scraper does a busy welding shop turn to when it needs to guarantee its output is first rate?

For G&G Steel in Russellville, Alabama, the answer is very easy: the SCRAPE-N-BURR.



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"There's nothing like the SCRAPE-N-BURR for removing spatter, slag and dross from the welding projects we work on," said Mike Hargett, welding supervisor at G&G Steel. "The tool's got some weight behind it, and it does an excellent job."

Turn back the clock a couple of years and things weren't so clean for Hargett. He says his welders were frustrated with other tools that just weren't able to do the job. "Before, we were using stainless bars, and it was a pain. We couldn't keep them sharp enough to remove the spatter."

As a result, Hargett found that his welders weren't being as productive as they could have been. Not only were they spending considerable time sharpening their scrapers, but also the scrapers weren't always effectively removing the waste.

"We now have about 30 to 40 of them on the floor for our welders to use. They are by far a better tool than what we were using before, and they're making us much more efficient," he said.

What makes the SCRAPE-N-BURR so effective is that it was developed by welders for welders. "We knew we could build a better mousetrap, because there really was no mousetrap out there," said Tim Houselog of Innovative Product Ideas, LLC, the maker of the SCRAPE-N-BURR. "People were using cold chisels and mason chisels and other handmade tools. But they were all experiencing the same frustrations. We were committed to making a steel blade that would last, and that could also be resharpened, giving it even longer life."

The outcome of that commitment is the DUALAST blade. Each blade has been specially formulated to maintain a strong working edge.

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continued on page 25

## SCRAPE-N-BURR PASSES WELDERS' TESTS – AGAIN AND AGAIN

continued from page 24

"The 'DUAL' working edge blade is designed to hold up to the repeated pounding of steel on steel without shattering, and it 'LAST's longer than any other solution on the market," said Houselog. "Unlike chisels that are only edge tempered, the DUALAST blade is specially treated to last and can be easily refreshed to factory edge specification when properly sharpened."

Understanding the need for versatility in the industry, the SCRAPE-N-BURR blade is manufactured in two shapes and a variety of sizes. All of the blades fit the SCRAPE-N-BURR's standard quality-made handle. And, all SCRAPE-N-BURR parts are made in America.

"We've been there. We understand the needs and frustrations of welders," said Houselog. "That's why we designed the SCRAPE-N-BURR. That's how we know it works better than anything else out there."

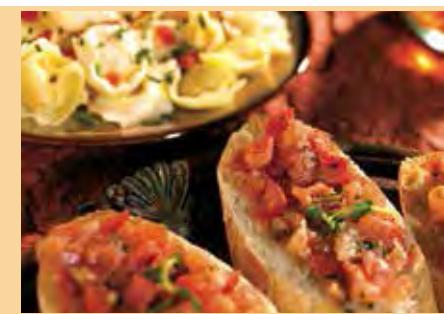
"The bottom line is that the SCRAPE-N-BURR removes spatter a whole lot better than we were able to do previously," said Hargett. "It cleans the weld area faster and it doesn't mar the metal. A quality-looking finish on the work we do is very important, and that's what we get with the SCRAPE-N-BURR." ■

*To learn more about the SCRAPE-N-BURR and see it for yourself, go to the Innovative Product Ideas Booth #N9084 or visit [www.scrapenburr.com](http://www.scrapenburr.com).*

SCRAPE-N-BURR and DUALAST are registered trademarks of Innovative Product Ideas, LLC.

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The heavy-duty washer has design features to minimize maintenance and increase machine life. The extra heavy silhouettes stiffen and support the sides and roof of the washer. The conveyor is located in a stainless steel track enclosure located in the washer housing designed to protect the conveyor from the chemical spray. The enclosure is pressurized to protect the chain from the moisture. The track

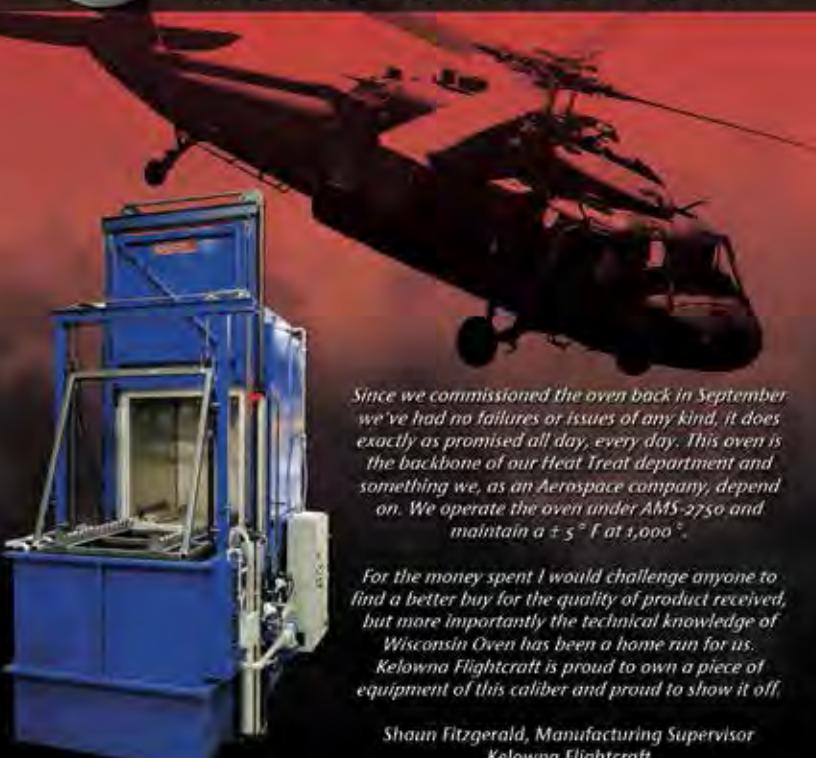
enclosure runs the full length of the washer. This equipment is designed in accordance with accepted industry standards employing the latest available technology.

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*Shaun Fitzgerald, Manufacturing Supervisor  
Kelowna Flightcraft*

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Clay Reiser - Director of Business Development at Impulse Manufacturing **”**



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ShopFloorConnect collects and analyzes efficiency metrics and OEE from any machine and features capabilities designed for discrete manufacturing, packaging, and food-and-beverage industries. ShopFloorConnect is scalable, and can be quickly implemented into any industrial environment. It comes ready to communicate directly over your network, and includes a powerful report-generator as well as a browser-based viewer that supports the 'visual factory' and real time displays.

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For additional information about ShopFloorConnect, call us at 800-586-8324 (US and Canada), 978-268-2700, or visit us at [www.ShopFloorConnect.com](http://www.ShopFloorConnect.com)

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# ShopFloorConnect® Software Announces New Application Program Interface (API)

The new web service enables easier sharing of job information with existing ERP and MES Software

**W**intriss Controls Group recently introduced a new data-sharing capability for its popular ShopFloorConnect

OEE and Downtime Tracking software.

The new Application Program Interface (API) is a SOAP 1.2-based web service that automates

Job Queue Management and data transfer between the scheduling functions of existing ERP/MES software and the ShopFloorConnect software/hardware. The new API allows ShopFloorConnect to gather the "next job" information from the existing scheduling system, and send it directly to the machine-mounted ShopFloorConnect Interface (SMI) controller — thus enabling paperless management of the production schedule. As jobs are completed, the API gives ShopFloorConnect the ability to report part counts back to the ERP/MES in real time.

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ShopFloorConnect displays real-time status information for all of your machines on your PC or mobile device's web browser. It automatically generates and delivers reports showing OEE, production, downtime summaries and other information, and provides the vital link to real-time data that is missing from many ERP and MES systems.

ShopFloorConnect is a turn-key solution that is scalable, flexible, and can be quickly implemented into any discrete manufacturing environment. It comes factory-configured to communicate directly over your LAN with the ShopFloorConnect Machine Interface (SMI).

The ShopFloorConnect Machine Interface (SMI) is installed on any machine, and using only two readily-available control signals can track the machine's operating status,

## Increased Confidence

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continued on page 30

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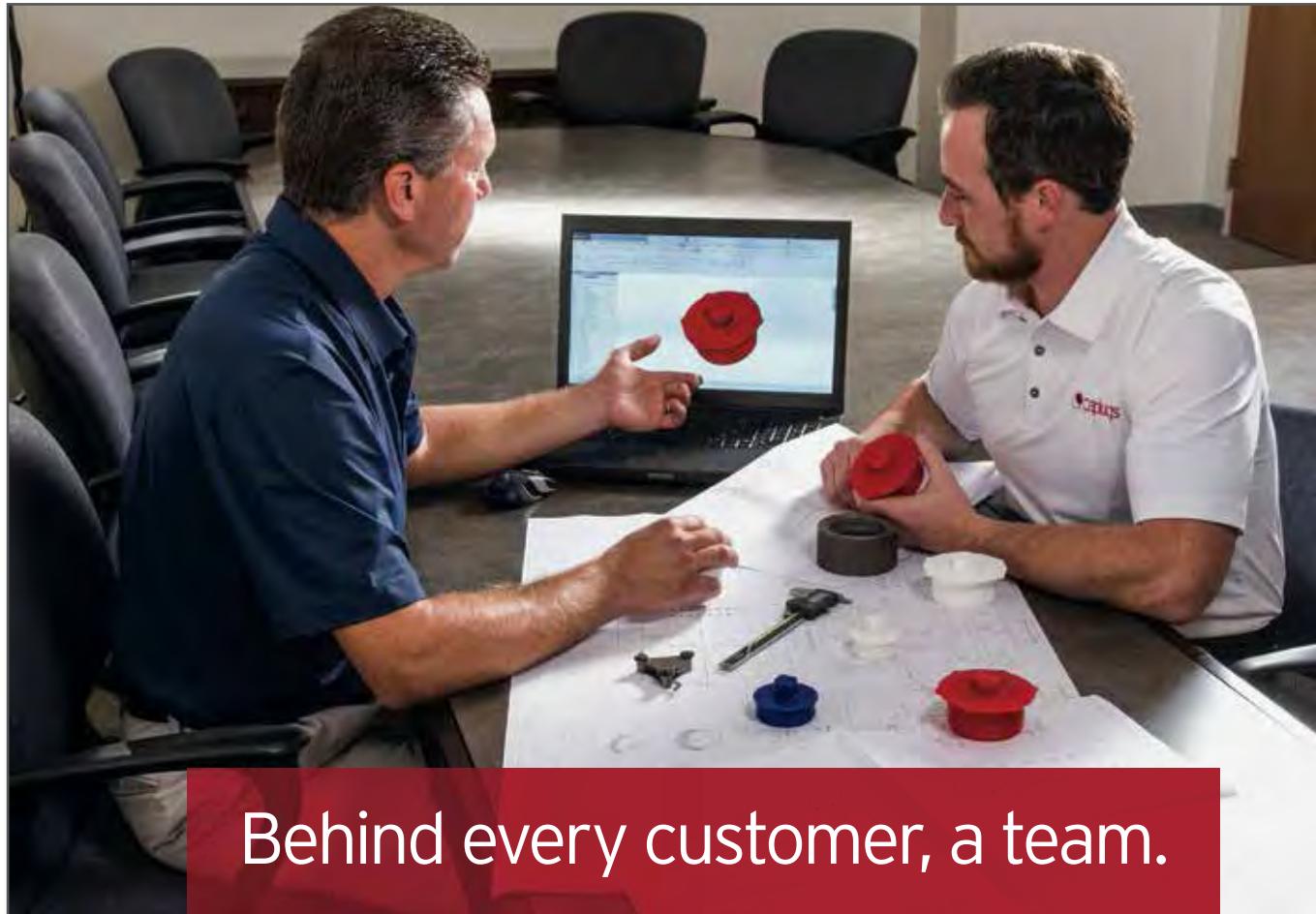


**SHOPFLOORCONNECT® SOFTWARE ANNOUNCES  
NEW APPLICATION PROGRAM INTERFACE (API)**

continued from page 28

production rate, and parts count (where applicable) – all with no operator involvement. It also has a touch-screen display which allows the operator to select a downtime reason from a user-configured menu. The

SMI has built-in Ethernet connectivity to communicate with the ShopFloorConnect server over your existing network. For more information visit Wintress Controls in booth S4221 or visit [www.shopfloorconnect.com](http://www.shopfloorconnect.com). ■



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*Make sure to take advantage of all the city has to offer by making plans after the show! Go to [choosechicago.com/FABTECH](http://choosechicago.com/FABTECH) to find details on all there is to do while you're in Chicago.*

# CobraMig® 300

**Detachable Wire Feeder**

# New!! X Series Digital Guns



**Simplified User Interface** allows quick and easy operations



Get Impressed!



# Transform your Aluminum Welding *CobraMig*® Is Back!!!

Introducing the new CobraMig 300 aluminum push-pull MIG welder with "CobraLoc".

CobraLoc allows the users to unlock the feeder from the power supply, giving them full portability.

Additionally, the Detachable digital wire feeder allows for Rail or Boom applications.

Additionally, the Detachable digital wire feeder allows for han or boom applications. Interface extensions of 25', 50' or more provide remote adjustments of the power supply.

#### **Extending the capabilities even further.....**

MK has developed a NEW series of Digital push-pull guns. The X Series digital gun gives the user ultimate control at their fingertips. Remotely changing the parameters or switch between memory programs directly from the gun. By combining feeder separation length and gun cable length, operations can now be managed directly at the gun, allowing complete control 100' or more from the power supply.

# Unique to Repeat

**Sharpe Products has the capabilities to meet your tube bending and tube laser cutting needs!**

**S**harpe Products an ISO 9001:2008 Registered manufacturing company offers many unique custom pipe and tube bending, laser cutting, and fabrication services using the latest state-of-the-art bending machinery and technology in the tube bending industry. Serving a wide range of OEMs, including the automotive, medical, and retail industries, their team has experience bending steel, stainless steel, aluminum, copper and more, up to 6" O.D. (outside diameter).

Simple to complex parts are bent with efficiency by using various bending equipment, including all-electric CNC bending machines that have unique high accuracy and repeatability along with multi-radius stacking and rolling, and hole-punching capabilities; A freeform (3D) tube bender that uses single die technology allows for flexibility in part design, unmatched by traditional forms of bending. It is capable of creating multi-radii bends without tooling and little to no distance

between bends and the ability to produce angles greater than 180 degrees; An E-turn tube bender which has the widest flexibility because of its in-process right and left bending with fixed and variable radius; And a twin head compression bender that simultaneously forms two bends and is ideal for high speed manufacturing of symmetrical shapes.

With the combination of a 3,000 watt fiber optic tube laser and lean CNC all-electric bending machines, the traditional more costly fabrication services can now be completed in a lean and efficient manner saving you time and money on custom projects.

## Traditional processes that the tube laser replaces include:

- Hole Punching
- Drilling
- Slotting
- Notching
- Coping
- Part Marking
- Etching
- High Quality Cut Edges

Any combination of these features can be put on one part with streamlined efficiency and minimal part handling. Highly reflective materials such as aluminum, copper, brass, bronze, and galvanized pipe can be cut along with the traditional materials steel and stainless steel. Material capacity for the laser is round pipe/tube up to 6 inch O.D. and square pipe/tube up to 4 inch.

Complete your custom project with tube end-forming and fabrication services. End-forming capabilities include beading, marmon beading, expanding, reducing, flaring, swaging, punching, threading, tube mitering, trimming, and piercing from 1" O.D. up to 7" O.D. Value-added services including welding are also available.

In alignment with an ISO Quality Management System, quality inspection processes are in place for every type of quality level needed for Sharpe's customers. From 100% fixturing on the BluCo to detailed reporting from a Tube Inspect S

and 3D laser scanner, customers are given confidence that manufacturing processes are undergoing quality verification check points throughout product development.

The Sharpe Team is ready for any pipe or tube bending project you may have, from prototypes to high volume production. ■

*For more information visit the Sharpe Products Team in Booth #N1032 or visit [www.sharpeproducts.com](http://www.sharpeproducts.com).*

## MILLER ELECTRIC MANUFACTURING COMPANY DEBUTS NEW PRODUCTS

continued from page 6

### N95 Disposable Respirator

#### Features



a flame-retardant outer layer that provides crucial protection for welding operators in environments where sparks or spatter could come in contact with the mask. The filter media offers 95 percent filtration of airborne particles, including hexavalent chromium, manganese and other weld fumes. An integrated valve eases breathing for the user.

### Millermatic® 211 Auto-Set™ MIG Welder

At 38 pounds, the redesigned Millermatic® 211 weighs nearly 50 percent less than before — with no loss of output power. Inverter technology produces a faster-reacting arc that is able to weld up to 3/8-



inch mild steel in a single pass, while advanced Auto-Set™ capabilities allow users to select from five wire and gas combinations. A Multi-Voltage Plug (MVP™) allows easy no-tool selection of either 120 V or 240 V power. ■



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# Bihler Debuts the 4Slide-NC

Bihler of America is excited to introduce 4Slide-NC, the new standard in slide forming technology. Benefits include highly efficient production of strip and wire parts even in the smallest batch sizes, higher production speeds, rapid response to short-term customer requests, reduced tool costs and debugging time, full tool compatibility to select mechanical 4Slide machines,

lot sizes can be processed in half the time, extremely short set-up times, user-friendly operation, integrated process and production monitoring, and multiple storage for tool setups. Other features include easy accessibility, an operator safety enclosure and a maintenance friendly setup. ■

*Stop by booth # S4784 to learn more about the 4 Slide-NC from Bihler!*

## Overton Industries Tube Forming Systems



Overton Industries is a family-owned, 3rd generation, manufacturing company established in 1968. Based in Mooresville, IN, Overton Industries has 2 divisions. The Tool & Die Division concentrates on the design and build of precision high speed, blanking, powder metal, and progressive dies and runs high speed production on Bruderer presses. The Die Division also has expertise in mold repair and ECN. Tube Forming Systems, located in Franklin, IN, is dedicated to fabricators of tubular products for the Automotive, Water Processing, and Tube & Pipe Production Markets. TFS has 5 distinct segments: End Forming Equipment & Tooling, Tube Mill Tooling, Tube Dies, Short Run Tube Production, and Automation & Cellular Integration. ■

*Visitors can learn more about all of Overton Industries products at booth #N1074.*



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**J**ustin Casper, a technology education teacher at Two Rivers High School in Wisconsin, knows his Metals 1 and 2 courses on print reading, drafting, welding, sheet metal, casting, sheet metal forming, and machine shop, aren't just your typical high school classes. These programs are a dire necessity for a resurging manufacturing industry that continues to struggle to fill hundreds of thousands of skilled labor job openings and whose employers increasingly are looking to high schools and community colleges to solve their future labor shortage problem.

But as a public educator, Casper found himself in a usual dilemma – a lack of funding to obtain the high quality, technological learning resources needed to enhance his curriculum and prepare his students for careers in manufacturing. Turning to Tooling U-SME, producers of the industry-leading Fundamental Manufacturing Processes video series, Casper got the support he needed when Tooling U-SME was able to connect him to Baileigh Industrial — a local metal fabrication and woodworking machinery equipment company in Manitowac, WI who was more than happy to purchase the entire video series (all 44 in-depth programs showing examples and applications of key manufacturing technologies and processes) for the high school program.

"Over the years, Baileigh Industrial has shown its commitment to the community in various ways," said Steve Wronkowski, General Manager of Baileigh Industrial, Inc. "One extremely important way is by supporting local education and future talent development for the manufacturing

continued on page 35

WISCONSIN FABRICATING EQUIPMENT COMPANY HELPS LOCAL HIGH SCHOOL OBTAIN VALUABLE MANUFACTURING VIDEO SERIES  
continued from page 34

industry. We look at this as an investment in the next generation of manufacturing on which companies all over the world will depend."

Baileigh Industrial, a designer and manufacturer of industrial metalworking and woodworking machinery since 1999, is now going on its 9th year as an exhibitor at FABTECH (Booth S1780).

"Progress happens when you leverage investment in technology and people within the manufacturing community," said Jeannine Kunz, SME's Director of Learning and Development. "As we build the capabilities of both today and tomorrow's workforce, and help educators and employers collaborate to develop the next generation workforce, we take pride in being a catalyst within manufacturing to drive meaningful economic growth and bridge that interaction."

Headquartered in Wisconsin, Baileigh Industrial also has equipment showrooms in California, Germany, UK and Australia. The company has invited Casper and students from his classes to visit and tour their Manitowac facility to see the exciting technology and careers inherent in manufacturing today. ■

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# New Breakthrough Flexwave Welder Technology Booth #N18025

### Combines Both CDW & MFC Welder Capabilities

The Flexwave Welder is a combination of an advanced Capacitor Discharge Welder (CDW) and a 1500Hz Bipolar Medium Frequency Converter (MFC), comprised of four IGBTs.

### Provides Better Quality Parts

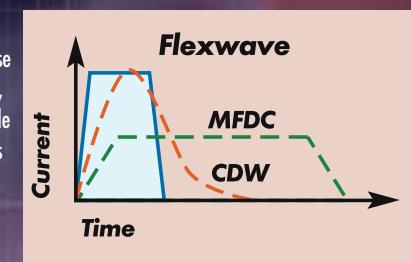
The feature of CDW that provides less thermal distortion with its large current in a shorter weld time is combined with the stability of MFC supported by its constant current feedback.

### Makes It Easy To Set Weld Parameters

While the weld current for CDW is configured by increasing or decreasing the charging voltage, which makes it more difficult for operators to understand the welding parameter setting, the Flexwave allows direct configuration of weld current values.

### Provides Energy Savings And Shortens Cycle Times

A typical CDW wasted the end portion of the weld current wave without any use. The Flexwave technology has the ability to manage the current flow to just what is required for the optimum weld, thereby achieving a shorter charge time for the next spot weld and generating energy savings as a by-product.

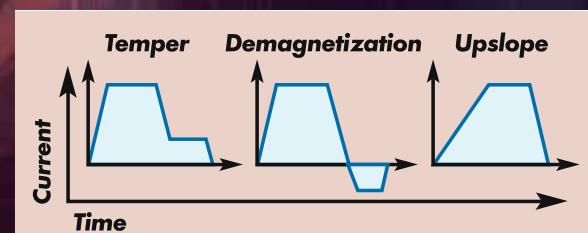


### Optimizes Weld Nugget Quality

As for weldability, a large current in a shorter weld time allows welding with less thermal distortion or indentation, even for materials such as aluminum that have high thermal conductivity as well as a thermal diffusion tendency. Additionally, the constant current feedback of the MFC function provides stable welding without fluctuations of weld current. This even includes the conditions of projection welding, which tends to display load variations because of protrusion changes, or even for high tensile materials, which tends to cause fit-up gaps because of its hardness. As another benefit, the capacitor is always fully charged, providing the fastest current start-up required by projection welding every time.

### Maximizes Waveform Flexibility

Waveform of current can be freely programmed in polarity at every 1 ms, allowing necessary welding parameter settings such as tempering, demagnetization, upslope, etc. Also, if the controller unit of your single-phase AC welder is replaced with the controller unit of Flexwave, it can be used as a Flexwave welder as well.



Flexwave series includes NICP-050, NICP-100, and NICP-150 with the maximum weld current of 50,000, 100,000, and 150,000 amps respectively.

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## Keynote

continued from page 1

year," she offered. "If you can save one percent on fuel per year, for Asian Airlines that's something like half a billion dollars a year in savings. So that's a profound impact."

In another example, she noted that GE's "brilliant wind farms" have connected their wind turbines to work together to reduce "wake loss," allowing utility customers to generate eight percent more energy and achieve eight percent more profit.

"When we combined and connected the data from our machines, what we found was that we needed to build an 'Industrial Cloud' for the data," she said. "We have done that and we call it Predix."

She then highlighted several areas where Predix allows the leveraging of platforms through "a digital thread."

"As we implement this digital thread in manufacturing within GE, we are seeing huge benefits," she asserted. "We have two times faster productivity and approximately 30 percent lower costs. And 30 percent lower costs is an eye-popping number for anybody. But for a company like GE that means 18

billion dollars. Obviously that's an incredible number and it's driving a lot of what we are doing today."

Characterizing GE's position as "at the beginning of this digital journey," Kerr then highlighted her own organization, GE Ventures, and its view of "manufacturing as an ecosystem."

She explained how that view, along with embracing initiatives like open innovation and leveraging the so-called "collective brain," has led to several recent investments in entities like the Digital Manufacturing and Design Innovation Institute (DMDII) and technologies like advanced fabrication, additive manufacturing/3-D printing, augmented and virtual reality, collaborative robots, and robotic field services.

Kerr said that the new technologies were also revolutionizing supply chain and logistics activities, and offered examples of recent GE investments in related technology companies in that arena as well.

One of Kerr's key messages to the audience was encouragement for potential industry partners – even small businesses – to join GE on its digital journey.

"What I want to say today is that it really isn't that expensive," she stated. "What we are seeing is a democratization of technology, where technology that really got developed in the consumer space at affordable price points is now starting to work its way back into industrial applications."

To illustrate her point, she referred to an internal research effort focused on building a robotic service to manage rail yards. One key component of the current project architecture is a \$200 consumer gaming console.

Along with technology and new business models, Kerr emphasized the critical importance of the people involved with the Fourth Industrial Revolution.

"We really need brilliant minds to help us in this journey," she said. "We need brilliant minds like yours to help us to continue to innovate and to move forward, because the future of our cities, our hospitals, and of our transportation infrastructure really depend on it."

Highlighting her own contact information, she concluded, "If you have any great ideas, feel free to contact me, because tomorrow's manufacturing future begins today."

## State of the Industry

continued from page 1

laser welding with gas metal arc welding, which he characterized as "two mature joining processes that exist, but by combining them together for thick section welding you can get increases in productivity by factors of two or three or four."

"Now there are a lot of nuances to how you do that," he cautioned. "Adding those two processes together changes the way that you prepare your material and changes some fixturing requirements. And it actually changes the performance requirements of the joint and how you qualify that joint. But there's an example where even though the combining of those two processes has been around for some time you don't see large scale application in manufacturing, because there are some nuances that are a bit tricky for folks to employ. But being able to do that could result in a large step improvement in some people's business."

Expanding on the concept of two technologies coming together, panelist Marni Rutkofsky, Director of Strategy and Marketing for GE Ventures, offered the instance of "two different companies coming together."

"For us, advanced manufacturing is about the technologies but it's also about changing the way that we work and changing the way that we work together," she said. "There are very powerful collaborations, such as DMDII and other types of mechanisms of having ecosystems to design and create together. And working with our customers and our supply chain in various different ways has been incredibly powerful. So I think advanced manufacturing is really a culture change for the workforce as well."

Building on that theme, panelists explored topics, including how they stay innovative, where they get trained people, the ongoing revolution in additive materials, cyber security issues surrounding both new and legacy manufacturing equipment and whether the individual panel members could identify any tax or regulatory issues that were having direct impact on their implementation of new technologies.

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## Attendees

continued from page 8

Deplaris described his current company as one of the largest manufacturers in Chicago. "We manufacture transformers and switching equipment for the electrical grid," he said.

"At S & C Electric, on the manufacturing floor, we're changing to a lean culture, a lean manufacturing methodology," he explained. "This is requiring us to reduce our inventory, which is going to result in some material handling issues. How can we ensure the reliability of our machines while continuing our throughput so we meet everything we need to do?"

Deplaris anticipates finding solutions by attending FABTECH, adding that he found the show's web site "very informative, very helpful. I was able review it before I came to develop a game plan. The guidebook is also very beneficial."

He continued, "I've seen a couple companies on the list for material handling and those will be some of my biggest stops today."



## Welding Wars Winners

Wednesday afternoon witnessed the much-anticipated announcement of this week's "Welding Wars" winners. The student competition required three-member teams to complete a designated fabrication project within a set time period. Teams were judged on technical knowledge, welding skills and demonstrated safety.

### THE WINNERS ARE:

**1st Place:** Jessica Mills / Joshua Walker / Andrew Hewko (pictured above)

**2nd Place:** James Hefner / Thomas Coutee / Kolby Adlong

**3rd Place:** Cory Martin / Drew Kooyenga / Mitchell Geister

## Candidate Conducts FABTECH Town Hall

Presidential Candidate Rick Santorum visited FABTECH on Tuesday morning to share his belief in American manufacturing and provide insight into his thoughts regarding political and economic issues.

Noting his childhood growing up in Butler, Pennsylvania, Santorum said

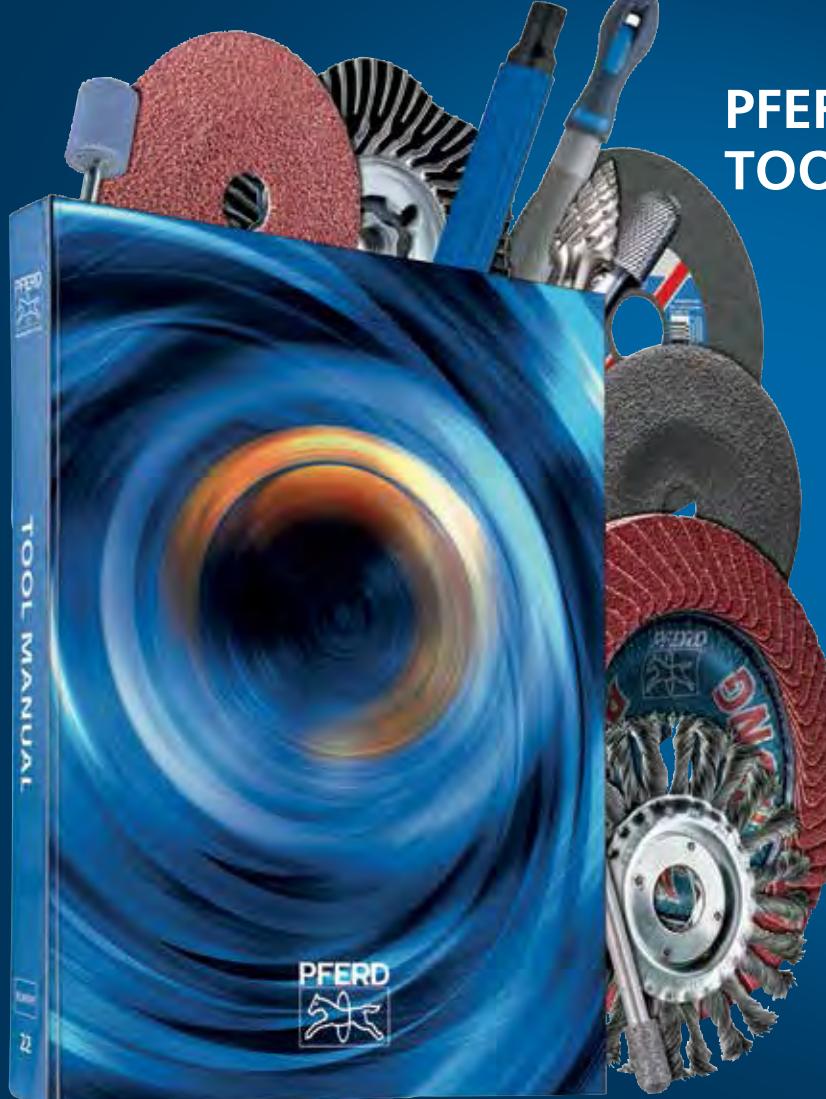
that he had announced his candidacy in May 2015 on the manufacturing floor at Penn United Technologies, stating that he chose the factory floor location "to make an exclamation point," adding, "Four years ago when I ran I talked a lot about how we had to bring our manufacturing sector back to have government

allow you to be more competitive."

Santorum continued his brief presentation talking about taxes and regulations on American businesses, explaining how he would approach the matter. Santorum also emphasized the importance of vocational education and closing the skills gap, asking attendees to continue their support of this vital pipeline of talent to the industry.

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# AIDA-America Corp. Announces the Advanced Servo Press Control Platform

AIDA-America Corp., with an unwavering commitment to product improvement, is pleased to announce the introduction of an advanced servo press control platform. AIDA's new control system significantly improves the performance of the industry leading AIDA DSF Series (Direct Drive Servo Former) servo presses.

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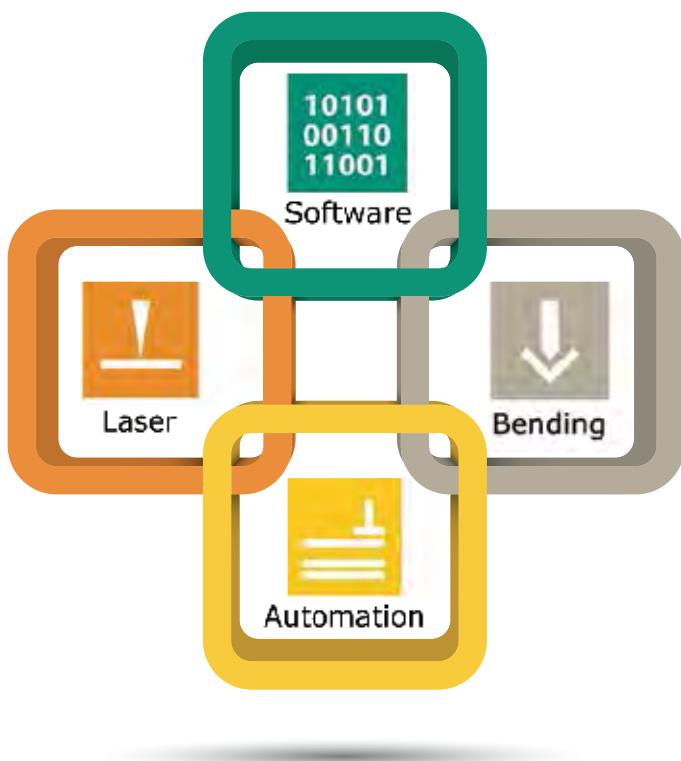
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