

DAY 1

MONDAY
NOVEMBER 11, 2019

THE OFFICIAL FABTECH PUBLICATION



FABTECH

NORTH AMERICA'S LARGEST METAL FORMING,
FABRICATING, WELDING AND FINISHING EVENT



SHOW DAILY

TODAY'S EVENTS

Keynote: FABx Tech Talks

8:30 AM – 9:45 AM
Lakeside Center Ballroom

Chad Hennings Meet/Greet

10:00 AM - 11:00 AM
FMA Booth D46708

Leadership Exchange: Emerging & Advanced Technologies for Manufacturing 2020

12:30 PM – 1:30 PM
Lakeside Center Ballroom

AWS Welding Competition

10:00 AM – 5:00 PM
Booth B17116

Smart Manufacturing Hub

Sessions All Day
During Show Hours
Booth A4138

Rest and Recharge Lounge

During Show Hours
North Building 2.0 Level
(by McDonald's)

Robotics & Industrial Automation Pavilion Showcases the Future of Manufacturing

There is no doubt that robotics and industrial automation are among the hottest trends in manufacturing and fabrication. That's why this year's FABTECH features a new pavilion devoted exclusively to those subjects.

Of all the industries that utilize robots, the fabricated metal parts and welding industries have the strongest correlation to robots used in manufacturing processes. From small to large job shops supplying OEMs, to Fortune 500 manufacturers including John Deere, Caterpillar, Boeing and General Motors, robotics and automation are transforming the industry.

Here are a just few of the many facets of these trends you can experience in the Robotics & Automation Pavilion.

Robotics in Fabrication

Millions of robots are already deployed in industrial applications. They are found in diverse areas such as automotive assembly lines, welding, painting, packaging and labeling. Basic models can move on two axes. More advanced models operate on as many as six axes. Some carry out one task over and over with speed and accuracy. Others execute complex tasks such as the machining or coating of complex components. As beneficial to production as this new technology is, the

high cost of entry and the technical complexity of robotic programming have presented a barrier to this technology being harnessed by many small and mid-sized businesses.

The good news is that this is changing. New tax incentives coupled with the latest automation software are bringing robotics to a much wider field. Small job shops are beginning to realize that robotics are no longer a distant dream.

Factory systems, Computer Numerical Control (CNC) equipment and other industrial systems often come fully integrated with robotics controllers. This enables operators to run them from one interface instead of either hopping from screen to screen or having to rely on robotics specialists for programming and maintenance. This has opened the door to a much wider deployment of robotics in welding, fabrication, and manufacturing.

Apart from the fact that the equipment itself is less complex and far easier to implement, there is good news on the financial side. Tax incentives were passed in 2018 in order to encourage more spending on robotics, automation, digitization and equipment modernization. Instead of companies only being able to write off a small portion of the cost of equipment each year, they can now deduct the entire cost in the first year. As a result, the

Association for Manufacturing Technology has forecast a jump in capital spending on manufacturing equipment by 12% per year for the next few years.

The Robotics & Automation Pavilion, then, is the ideal opportunity for anyone wanting to try out the latest tools, software and robotics applications and see how they might streamline existing operations.

AGVs are Big Business

Automated Guided Vehicles (AGVs) may be a good starting point for those looking to add robotics to the shop floor. AGVs are a type of robot used to move things around the workplace. The market is booming. Valued at \$2.49 billion in 2018 according to Grandview Research, an annual growth rate of 15.8% is predicted between 2019 and 2025.

Why? AGVs offer warehousing efficiency, improved logistics management, more rapid delivery, higher product quality, reduced risk of workplace injury and lower labor costs. Many manufacturers are tying AGVs into their automation and control systems as part of ongoing Smart Factory initiatives.

Amazon is in the forefront of this trend. It deployed 15,000 AGVs several years ago and saw an immediate fall in delivery times,

continued on p. 8



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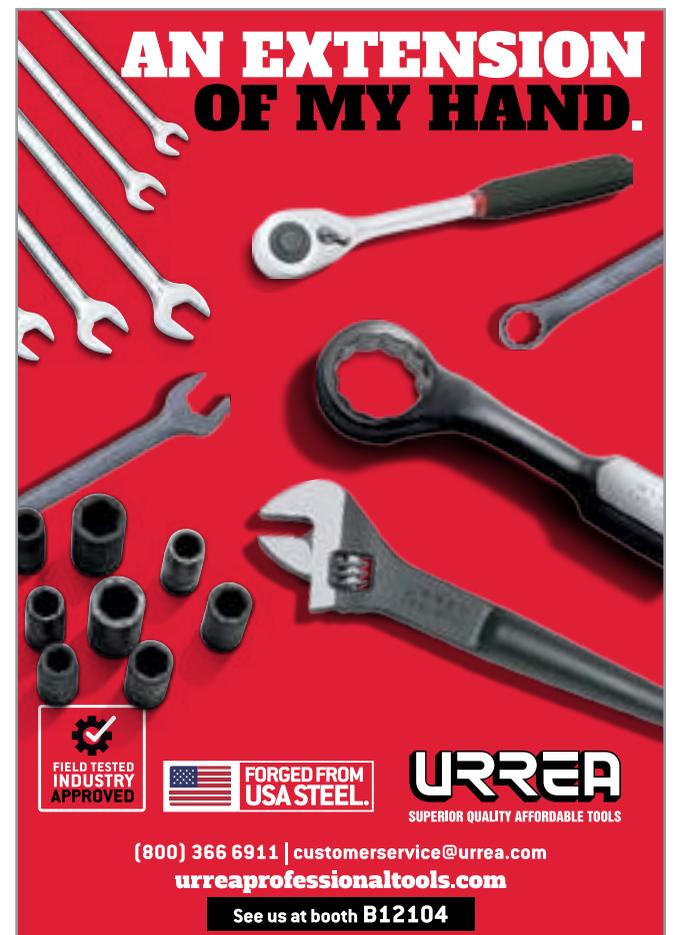
Pneu-Mech Systems was established in 1991 by a management group of six individuals who had worked together in the industrial sheet metal fabrication business since 1973. Originally, this group was involved in air filtration systems, but branched into finishing systems for the furniture industry in 1980.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

Pneu-Mech Systems has two Statesville, North Carolina manufacturing facilities, with over 75,000 sq. ft., that are equipped with all the essential equipment. Hi-definition plasma cutter, metal shears, press brakes, spiral duct fabrication, and saws to fabricate specialized and custom paint systems from flat

metal to finished equipment. The fabrication staff is highly experienced in the craft of building systems in modular form to be freighted to 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 them a great choice as a supplier. The installation staff is highly experienced in the mobilization, rigging and placement of specialized finishing systems. Pneu-Mech is proud of their staff; highly trained and experienced in the installation and integration of their systems to meet customer needs. Focused on "being easy to do business with", Pneu-Mech provides training, production assistance, troubleshooting and all service work required to install and maintain our systems.

Pneu-Mech considers the clients they serve as partners, and highly value long term relationships and welcome the opportunity to add you to the rapidly growing list of satisfied customers. **Visit Pneu-Mech in Booth B15008.** ■



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ESAB University, Oxy-Fuel Cutting Contests and Weld with ESAB Daily Prize Drawings

After overwhelming demand last year, look for an expanded ESAB University at FABTECH 2019, with even more welding and cutting educational events in booth B17087. Additional educational events in the ESAB University area include presentations and Q&A sessions surrounding the common challenges fabricators face every day and how to solve them.

For those who want to show off their skills with a Victor® oxy-fuel torch, sign up for one of the coveted slots in the Victor® *Rulers of the Flame* cutting contest.

Booth visitors who participate in an educational event, contest or hands-on demo will receive an entry form for the *Weld with ESAB*

daily prize drawing for a Rebel® EMP 215ic multi-process welder or Thermal Dynamics® Cutmaster® 60i plasma cutter.

ESAB University

ESAB University returns to FABTECH – this year in collaboration with leading online

educational site Weld.com – to offer more courses and time slots throughout the show. Visitors can learn practical fabrication tips and techniques from Bob Moffatt, host of Weld.com and a full-time welding instructor at Cowley College; Mike Becher, co-host of Weld.com; Ian Johnson, an off-road and fabrication expert and host of MotorTrend TV's *Four Wheeler*; and Jason Becker, a senior welding instructor at Valencia College.

Classes feature instruction, live demonstrations and a Q&A with the instructors. Register now at esab.com/esabuniversity for a chance to participate in one of these coveted classes:

Monday, November 11

11-11:45 AM: TIG Basics with Ian Johnson

3-3:45 PM: Gas Cutting Basics with Bob Moffatt and Jason Becker

Tuesday, November 12

11-11:45 AM: MIG Basics Part 1 with Bob Moffatt

3-3:45 PM: MIG Basics Part 2 (Modes of Metal Transfer) with Bob Moffatt

Wednesday, November 13

11-11:45 AM: Stick Basics with Jason Becker

3-3:45 PM: Passing AWS D1.1 with Jason Becker

Thursday, November 14

11-11:45 AM: Employment after Welding School with Bob Moffatt, Jason Becker, Mike Becher and Ian Johnson

Will You Emerge Victorious?

Got nerves of steel, steady hands and mad cutting skills? Then you can compete in the *Victor Rulers of the Flame* oxy-fuel cutting contest, held seven times throughout the show.

The elimination format starts with eight competitors going head-to-head at two cutting stations. The first round features strictly speed, where contestants will cut out the Rulers of the Flame logo. As contestants are eliminated, the contest gets progressively more challenging by requiring a combination of speed, accuracy, cut quality and techniques such as piercing.

Each round winner receives a Victor Performer EDGE™ 2.0 cutting, welding and heating outfit. Based on an assessment of combined cutting skills, a final winner will be chosen on the last day of the show and will receive a Rulers of the Flame jacket and a Thermal Dynamics® Cutmaster® 60i. ■

STEPHEN "RIPPY" MARSHALL
HEAVY EQUIPMENT MECHANIC
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Robotics & Industrial Automation Pavilion Showcases the Future of Manufacturing

continued from p. 1

heightened service levels, and more flexible production processes. The automotive industry, too, is a big player in AGVs. With labor being expensive and in short supply in many regions, AGVs can prove to be an economic way to streamline operations.

Improvements in technology have made AGVs easier to implement and more affordable. Today's AGVs are more reliable and are better integrated with production, control, and automation software. Plant safety requirements, too, are often embedded into their

operations to avoid obstacles and respond to potential safety issues.

Artificial Intelligence and Automation

Artificial Intelligence (AI) is one of the buzz words of the moment. But beyond the buzz, there is plenty of substance. Analyst firm Frost & Sullivan recently zeroed in on how strongly AI is influencing automation and manufacturing. Its study of AI found that automation and digitization of the shop floor are front and center in the disruption of traditional manufacturing business models. From design, to engineering and deployment, to operations, the shop floor is being reimaged and AI lies at the heart of it.

Why is AI flourishing? Some see it as an answer to labor intensive engineering tasks that require constant verification, rework and re-keying of data into several different systems. Such workflows are inefficient and tie up personnel on menial tasks instead of allowing them to focus on their areas of expertise. As a result, parts sometimes go missing, actions fall through the cracks, and projects are delayed.

AI and digitization can transform traditional practices. AI-enabled technologies such as natural language processing, problem solving, image/object/sound recognition and machine learning make it possible for machines to act in ways that are similar to humans. These smarter machines can learn the details of context to sort through massive amounts of data with speed and accuracy. Systems can study production data sets to develop better programs for operations. Organizations can glean insight and competitive advantage from the data being collected by their many systems.

Such systems, though, would never replace humans. They would relieve operators of repetitive tasks and take care of routine decisions related to maintenance checks and quality control. Simple decisions would be relegated to the machine to decide based on AI. All other decisions would be referred to the operator, sometimes with possible actions suggested by AI. In this way, the skills of the individual can be better harnessed in the performance of more challenging tasks.

Augmented Reality in Fabrication

Augmented Reality (AR) is another big trend in fabrication and manufacturing. However, there has been some confusion between AR and virtual reality (VR). Consumer VR products such as Oculus Rift immerse the user in an artificial environment existing only on-screen. AR, on the other hand,

continued on p. 10

McDantim

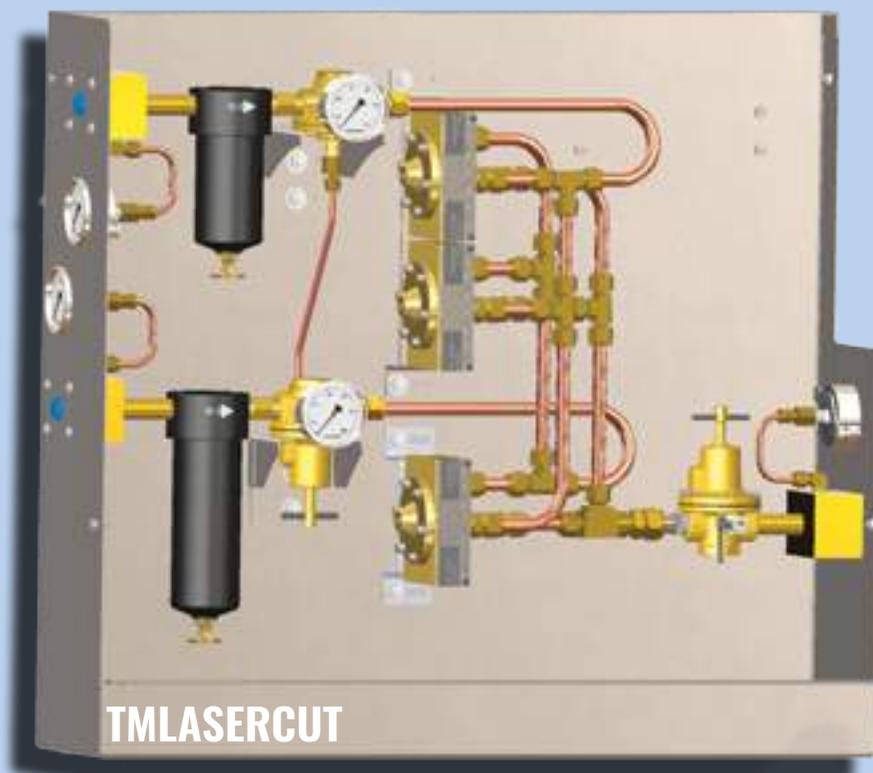
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continued from p. 8

overlays virtual objects on top of the real world to aid the user in understanding, perceiving, or acting. PDFs, diagrams, step-by-step instructions and other aids can be superimposed onto smart glasses and other devices.

The latest versions have added another valuable feature. They can now anchor virtual images to physical objects. This enables the user to move around an object while the virtual image adjusts to align precisely with the real world. This assists a welder, fabricator, or

assembler by providing AR images that fit the context of what is being viewed.

This technology is growing steadily in popularity in the industrial world. Analyst firm International Data Corp. put worldwide spending on AR/VR at around \$18 billion last

year, almost double the previous year. Far from being a predominately consumer trend, more than 60% of the total revenue already comes from industrial and applications.

Forrester Research predicts that about 14.4 million U.S. workers will be equipped with AR-based smart glasses by 2025, up from close to half a million today.

Popular uses include on-site assembly, safety, process manufacturing, training and maintenance. Benefits include reduced human error, faster execution, less downtime, fewer breakdowns, boosted productivity, and higher profitability. In addition, work tasks can be more easily documented and reviewed by supervisors.

New hires can also be trained faster by feeding step-by-step instructions to their smart glasses to guide them through complex tasks. The AR system documents their actions as they are completed and makes them available to other plant systems. By bringing together the digital and the physical worlds, AR can add enormous value to manufacturing and fabrication.

Visit the Robotics & Industrial Automation Pavilion in Hall A to view the various technologies that are changing the face of manufacturing. Demonstrations are available for many of the latest innovations in robotics, industrial automation, software, material handling and more. Exhibitors cover the complete range of the newest trends. This includes companies who design, produce and sell robots; makers of robot components and robot-specific technology; robotic integrators that link robot suppliers to the end user and provide turnkey solutions for the design, construction, testing, and delivery of fully functioning robotic systems; robotic periphery suppliers offering grippers, shovels, tool changers and sensors; and vision system manufacturers and motion control manufacturers. ■



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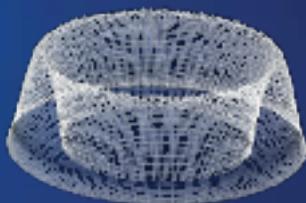
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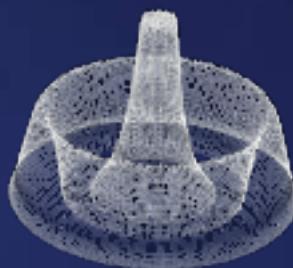
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COLE-TUVE/SAHINLER'S 4-Roll HSL Plate Roll Supports Automation and Costs Less

COLE-TUVE has added the Model 4R HSL to its line of 4-roll hydraulic plate bending rolls. 4R HSL is offered in 3', 4', 5' and 6' widths. It is ideal for the lighter 11 ga. to 3/16" thickness capacities, and with roll

sizes of 3.94" to 5.12" these machines can roll down to small diameters.

As with the larger capacity 4-roll Model HS, the HSL is fully hydraulic and has a two-roll

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4R HS models are offered in 5' to 10' widths with thickness capacities ranging from 1/4" to 1/2". The largest 4-roll machines are in the 4R HSS line and they are three roll drive to appropriately handle the heavier capacities that can go up to 20' wide and over 3" thick.

With a very attractive price point, the 4R HSL can be a good alternative for those who are looking to buy an initial-pinch machine but want the benefits of a 4-roll machine or perhaps optional automation. Initial-pinch machines are not able to support automation. The 4R HSL does, and with everything this model has to offer, it's worth considering with or without automation!

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Welding Tips & Tricks Podcast Live from FABTECH

In 2016, Jonathan Lewis, Owner of Superior Welding, Roy Crumrine, Owner of Crummy Welding, and Jody Collier, the mastermind behind all the videos on weldingtipsandtricks.com, teamed up to create the Welding Tips & Tricks Podcast in hopes of inspiring and assisting others using a totally different platform. When they started the podcast, they wondered if anyone would listen and if it would have a good impact. Being able to readily talk about “tips and tricks”, the podcast helps others and has led to great feedback and many loyal listeners that keep the podcast going strong. These three welders have a wealth of knowledge and years of priceless experience that has led them to become a staple in the welding community.

This entertaining trio will be at FABTECH doing a live podcast panel today in the Lakeside Ballroom from 2pm-5pm. You never know where a career in welding will take you, and these three have the experience and stories that give insight to the possibilities. Bring your welding and business questions with you for this special panel podcast.

Check out the YouTube channel [weldingtipsandtricks](http://weldingtipsandtricks.com) for countless amazing welding videos. Each video on YouTube comes with a description and detailed article on weldingtipsandtricks.com. ■



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Made with Pride in the U.S.A.

voestalpine Böhler Welding, a global leader in welding consumables, has once more demonstrated its focus on customer proximity with its latest \$25 million investment in a new welding consumables manufacturing facility in Portage, Indiana. Customers are now able to source unalloyed and stainless welding wires, as well as seamless and folded flux cored wires by Böhler Welding “Made in USA” from the facility. Further benefits of the new production facility are shorter delivery times and an optimized warehouse location strategy. More than 50 new jobs have also been created on the roughly 155,000-square-foot site.

Now Available from Portage, Indiana:

PRODUCT	AWS	DESCRIPTION
diamondspark 46 MC	E70C-6M H4	Seamless metal cored wire, unalloyed
diamondspark 52 RC	E71T-1C/M	Seamless flux cored wire, unalloyed, rutile type
FOXcore 46 MC	E70C-6M H4	Folded metal cored wire, unalloyed
FOXcore 52 RC	E71T-1C/M	Folded flux cored wire, unalloyed, rutile
Avesta ER308Si/ER308LSi	ER308LSi	Stainless GMAW wire
Avesta ER309Si/ER309LSi	ER309LSi	Stainless GMAW wire
Avesta ER316Si/ER316LSi	ER316LSi	Stainless GMAW wire
BÖHLER Q S-6	ER70S-6	Solid wire, unalloyed

Increased Arc Time — Lower Costs

The diamondspark product family, by Böhler Welding, covers a full range of premium seamless cored wires. These seamless cored wires are today's best choice for welding applications with the most stringent requirements for productivity, safety and weld quality - such as robotic manufacturing and mechanized welding, high integrity components in demanding industries, high and ultra-high strength steel welding, and for low hydrogen applications.

Whether you weld manually close to the power source or robotic with long leads – problem-free wire feeding is what you will get. The seamless, copper coated wire design adds sufficient stiffness and glide to

overcome friction in liners, welding guns and contact tips. The copper coating enhances current transfer between contact tip and wire – and together with arc stabilizers in the filling – promotes good arc ignition and a stable arc. Within the field of flux-cored arc welding, the seamless design offers optimal protection against moisture

absorption and thereby against hydrogen induced cracking.

Excellent Weldability and Bead Appearance

Böhler Welding stainless wires offer productive and versatile alternatives for the welding of

stainless steel. For high-alloyed base materials precise alloy adjustments ensure high quality welds with excellent mechanical properties and corrosion resistance. The wires offer excellent wetting and a smooth surface with

continued on p. 20



PRODUCT CHARACTERISTICS	USER BENEFITS
Problem-free feeding	Increased arc time and higher production output
Stable arc	Uniform bead shape and weld penetration
Good arc ignition	High quality welds with multiple starts
Controlled wire cast and helix	Precise wire positioning
Available in 550 lb drums	Drastically increased net arc time

Matchless in Stainless

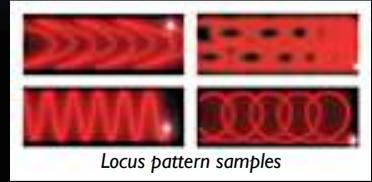
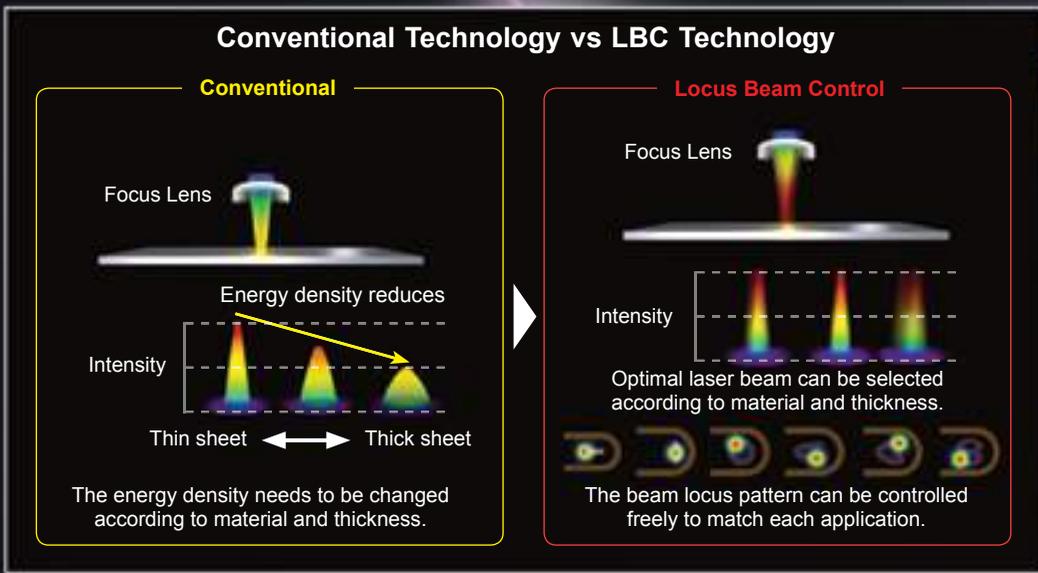
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AMADA's Carolina Technical Center and Manufacturing Center in High Point, NC will open in 2020.



North American **DEBUT**

North American **DEBUT**



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- **HRB 1003** — The new HRB Series of Press Brakes leverages AMADA's latest bending technology and a variety of production-enhancing features to provide an outstanding price/performance ratio.

North American **DEBUT**

- **AMADA's latest 9kW Linear Fiber Laser Cutting System** — will be ceremonially unveiled at FABTECH.
- **ENSIS 3015 RI** — 3kW Fiber Laser with an integrated Rotary Index that enables you to switch from flat cutting to tube or pipe cutting in less than 2 minutes.
- **EML 2515 AJ** — 3kW Punch/Fiber Laser Combination Machine that's equipped with a multi-purpose turret and the unlimited shape cutting flexibility of a fiber laser which gives you the flexibility to work with your customers to create more efficient part designs.
- **ENSIS 9kW + AMS 3015 CL** — The ENSIS Fiber Laser and AMS CL Automation are both manufactured in Brea, CA. ENSIS technology provides continuous processing of thin materials and thick plate without a cutting lens change or manual setup. The AMS 3015 CL is a modular system that allows you to easily expand your automation capabilities as future demands evolve.
- **HG 1003 ARS** — A Fully-Integrated Robotic Bending System with a 7-axis robot, Automatic Gripper Changer (AGC), and Automatic Tool Changer (ATC) with patented AMADA tooling — that will enable you to achieve high levels of unmanned productivity.

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Continuous Innovation Fuels Customer Growth

As the world's leading innovator of sheet metal fabrication equipment, AMADA AMERICA, INC (Booth A2103) showcases its industry-leading manufacturing solutions that maximize productivity and profitability for North American manufacturers.

AMADA will introduce the VENTIS 3015 AJ fiber laser cutting system, the world's first

fiber laser cutting system with Locus Beam Control (LBC). LBC Technology freely manipulates the laser beam to create an infinite number of locus patterns and greatly enhance cutting performance. In conventional fiber laser cutting systems, energy density reduces as material thickness increases, resulting in a lack of efficiency. In marked contrast, LBC

Technology offers flexible beam pattern control matched to each application, while retaining high-efficiency cutting and high energy density. As a result, VENTIS achieves cutting speeds up to 3 times faster than a conventional 4kW fiber laser while producing superior edge quality.

Do not miss the chance to see the 9kW REGIUS 3015 AJ, AMADA's latest 9kW linear fiber laser cutting system to be ceremonially unveiled at FABTECH. Also making its North American debut, the HRB Series press brake. The HRB Series of press brakes leverages AMADA's latest bending technology and a variety of production-enhancing features to provide an outstanding price/performance ratio. This latest advancement in press brake technology also features the HRB 1003 ATC. Combined with AMADA's patented Automatic Tool Changer (ATC), fabricators can perform even the most complex tool setups in less than four minutes. The new HRB series of press brakes will be produced at the Carolina Manufacturing Center in High Point, NC opening in 2020.

AMADA's booth also features the 9kW ENSIS 3015 AJ fiber laser cutting system paired with AMS 3015 CL automation. The ENSIS fiber laser and AMS CL automation are both manufactured in Brea, CA to provide quick delivery and customer access to engineering support. ENSIS technology provides continuous processing of thin materials and thick plate without a cutting lens change or manual setup. The AMS 3015 CL is a modular system that allows you to easily expand your automation capabilities as future demands evolve.

Additionally, demonstrations of an ENSIS 3015 RI (rotary index) fiber laser cutting system showcase how this machine enables fabricators to switch from flat sheet cutting to tube or pipe cutting in as little as two minutes. The AMADA booth also exhibits the latest in automated bending technology with the HG 1003 ARs. This fully-integrated robotic bending system is comprised of a 7-axis robot, Automatic Gripper Changer (AGC), and Automatic Tool Changer (ATC) with patented AMADA tooling so fabricators can achieve high levels of unmanned productivity.

Lastly, Booth A2103 exhibits the EML 2515 AJ, a 3kW fiber laser/punch combination machine that's equipped with a multi-purpose turret and the unlimited shape cutting flexibility of a 3kW fiber laser. This provides fabricators the flexibility to work with customers to create more efficient part designs. AMADA Marvel will also be displaying five of their productivity-enhancing bandsaw machines.

Visit AMADA AMERICA's booth and learn more about how our state-of-the-art manufacturing solutions will help your business grow. ■

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MONDAY, NOVEMBER 11

SCHEDULE-AT-A-GLANCE

TECHNOLOGY	8:00 AM – 9:30 AM	10:00 AM – 11:30 AM	12:00 PM – 1:30 PM	2:00 PM – 3:30 PM	
3D/ADDITIVE MANUFACTURING	■ NEW! F10: Application Discovery - Evaluating Real Use Cases for In-Office Metal 3D Printing Room S403A	■ NEW! F20: 3D Printed Tools for Additive Manufacturing Environments Room S403A	■ NEW! F30: The Ultimate Guide to Metal Additive: Mapping the Process from Discovery to Production Room S403A	■ NEW! F40: Metal 3D Printing for Fabrication Shops Room S403A	
AUTOMATION	■ NEW! F11: Move to the 21st Century: The Pro's and Con's of Adding Automation to Your Process Room S401D	■ F21: Getting Started with Robotics: A Journey to the World of Robotics Room S401D	■ NEW! F31: Leading and Preparing an Industry 4.0 Organization and Workforce Room S401D	■ NEW! F41: Industrial Internet of Things (IIoT) for the Job Shop Room S401D	
CUTTING		■ NEW! F22: Cutting for Advanced Materials Room S404A		■ NEW! F42: Automated Processes in Hybrid Induction & Oxy-Fuel Cutting Room S404A	
FINISHING		■ C20: ABCs of Infrared Room S501A		■ NEW! C40: It's Your Money - Control Your Costs Room S501A	
		■ NEW! C21: I Want to Powder Coat, Now What? Room S501BC		■ C41: Powder Coating Basics Room S501BC	
		■ NEW! C22: Corrosion Basics and Prevention Room S501D		■ NEW! C42: Understanding the Basics of Pretreatment Room S501D	
FORMING & FABRICATING	■ F13: Press Brake for Engineers Room S502A	■ F23: Machine Safeguarding Room S502A	■ NEW! F33: Material Handling Room S502A	■ F43: Advanced Press Brake Technologies Room S502A	
	■ F14: Coil Processing: Slitting HSS Materials Room S502B	■ F24: Roll Forming: Basics and Lubricants Room S502B	■ F34: Roll Forming: Tooling and Trouble Shooting Room S502B	■ F44: Advanced Solutions for Tube and Pipe Room S502B	
LASER		■ NEW! F25: Lasers for Joining Development and Control Room S403B	■ NEW! F35: Remote Laser Joining & Interface Applications Room S403B	■ F45: Lasers and Laser Systems for Advanced Manufacturing Room S403B	
LEAN	■ NEW! F16: Lean Principle: Getting Started with Your Lean Journey Room S401A	■ NEW! F26: Lean Tools: Flow & Pull in High Variety Environment Room S401A	■ NEW! F36: Lean Principle: OEM Quality Excellence: 6 Practical Steps to Becoming an Award-Winning Supplier Room S401A	■ F46: Lean Principle: Strategic Planning and Hoshin Kanri - How to Achieve the Future You See Room S401A	
MANAGEMENT	■ NEW! F17: Choosing the Best Source of Growth Capital for Your Manufacturing Business Room S404BC	■ NEW! F27: Planning for the Present & Paving a Strategic Roadmap Room S404BC	■ F37: Job Shop Costing, Estimating and Scheduling for Complex Jobs Room S404BC	■ NEW! F47: Hands-on Workshop - Cultivate & Value Your Leadership Room S404BC	
MARKETING & SALES	■ NEW! F18: Supercharge Your Networking & Inbound Marketing Room S405A	■ NEW! F28: Your Schematic for Assembling a Powerful Digital Marketing Machine Room S405A	■ NEW! F38: Build a Sales Strategy & Model for Scalable Growth Room S405A	■ NEW! F48: Deliver Superb Customer Service & Build a Customer-Centric Culture Room S405A	
SMART MANUFACTURING	■ NEW! F19: Current State of Smart Manufacturing & The Connected Viewpoint Room S402B	■ NEW! F29: Smart Manufacturing Basics to Get Started in The Digital World Room S402B	■ NEW! F39: Industrial IoT Case Study - Real World Implementation Room S402B	■ NEW! F49: Smart Manufacturing and Workforce Ready! Room S402B	
STAMPING		■ NEW! S20: Understanding Servo Metal Stamping Presses - Proper Usage, Troubleshooting and Maintenance Room S503A	■ S30: ANSI Z224.1 & OSHA 1910.147 Applications of Alternative Methods for Hazardous Energy Control Room S503A	■ NEW! S40: Application of Real-Time Visual Monitoring Tool in Stamping Room S503A	
		■ S21: Lubricants-1 Room S503B		■ NEW! S41: Lubricants-2 Room S503B	
WELDING FABRICATION		■ NEW! W200: The Welding Economy Room S404D		■ NEW! W400: Robotic Welding for Job Shops Room S404D	
WORKFORCE DEVELOPMENT	■ NEW! F200: Practicing Emotional Intelligence for Workplace Success Room S401BC	■ NEW! F211: The Future of Talent: Attracting and Retaining The Top Talent for the 21st Century Room S401BC	■ NEW! F212: Creating Career Path Programs That Empower & Engage Room S401BC	■ NEW! F213: Pushing Your Envelope: How Smart People Overcome Self-Doubt and Live with Bold Enthusiasm Room S401BC	
WELDING					
CAREER PATH WORKSHOPS	■ W17: Getting Started in Underwater Welding Room N132			1:00 PM	3:00 PM
	■ W18: Creating a WPS in 60 Seconds Room N136			1:00 PM	3:00 PM
PROFESSIONAL PROGRAM	■ W23: SESSION 1: Additive Manufacturing I Rooms N138-N140			1:40 PM	5:00 PM
	■ SESSION 2: Modeling Rooms N138-N140			1:40 PM	5:00 PM
	■ SESSION 3: Arc Welding Rooms N138-N140			1:40 PM	5:00 PM
SPECIAL PROGRAMS	■ W30: AWS Prayer Breakfast Room N227B			7:00 AM	8:30 AM

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

■ = Basic ■ = Intermediate ■ = Advanced

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continued from p. 15

less oxidation. The arc is extremely stable resulting in a minimal amount of spatter.

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Improved arc stability	More consistent weld deposits Fewer weld defects
Improved feedability	Less feed roll tension; Less down time

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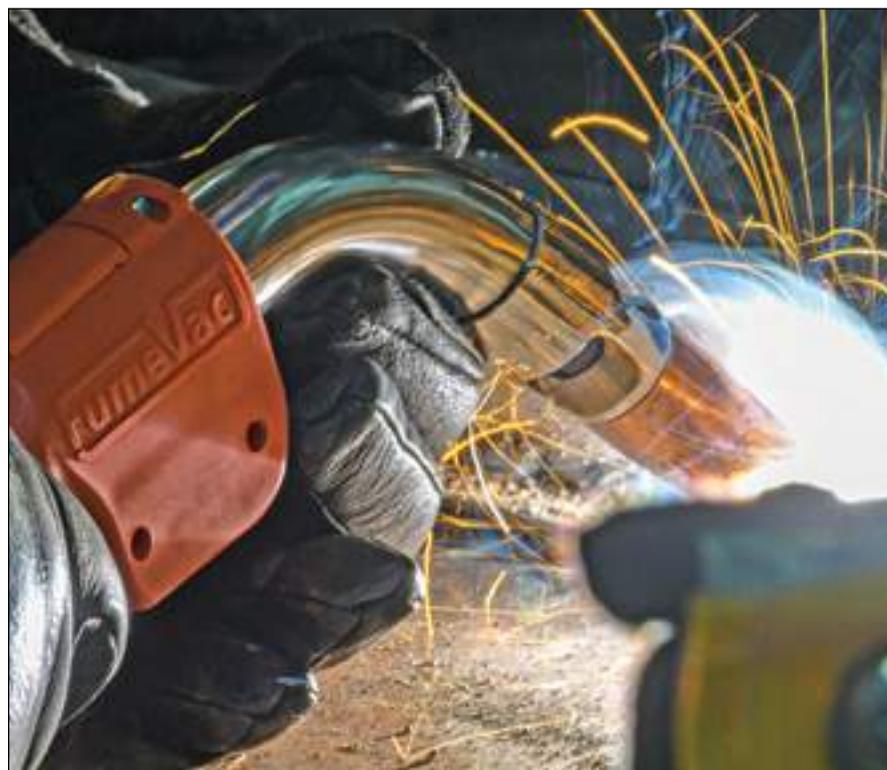
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State of the Industry: Automation in Manufacturing

Tomorrow's State of the Industry panel session will feature distinguished speakers from ARM – Advanced Robotics for Manufacturing, MxD, Siemens Industry Inc. and Aris Technology discussing the latest on robotics and the impact on modern manufacturing.

As a leading collaborative in robotics and workforce innovation, ARM helps to accelerate the advancement of transformative robotic technologies and education to increase U.S. global manufacturing competitiveness. Structured as a public-private partnership, ARM was founded in 2017 in Pittsburgh, PA by Carnegie Mellon University. Funded by the Department of Defense, ARM is part of the Manufacturing USA network.

ARM bridges the gap between more than 200 leading organizations in industry, government, and academia, all dedicated to catalyzing a national manufacturing ecosystem. From major technology companies to impactful start-ups, from traditional four-year universities to trade schools and community colleges, ARM believes that by bringing together organizations with diverse skills and perspectives, membership will drive the future of American manufacturing.

Jay Douglass, Chief Operating Officer (COO) at ARM will explain how automation is changing the manufacturing landscape.

“All organizations have an obligation to improve cost, quality, and time to market for their products,” he says. “Automation is a key source of those improvements, as it makes companies stronger and more competitive. That’s why so many U.S. manufacturing companies are investing in automation and robotics.

Douglass sees such technologies as having a profound influence that is shaping the future of manufacturing. He says we are now in the midst of the 4th Industrial Revolution. The first Industrial Revolution in the 18th century was based upon the harnessing of steam power, sailing ships and networks of canals to create factories and to more easily move goods to markets. The Second Industrial Revolution in the 19th century was propelled by the discovery of electricity, the formation of railway networks and assembly line systems to mass produce goods. The Third Industrial Revolution in the 20th century owes its success to microchip and computer technology as well as the rise of the Internet.

Now in the Fourth Industrial Revolution, (also known as Industry 4.0), it is Artificial Intelligence (AI), robotics and digitization that is leading the charge, says Douglass. As a result,

companies that are investing in automation are becoming more competitive, while those that aren't are getting left behind.

As in earlier revolutions, change brings confusion and rapid change. Old jobs become

obsolete. Thus it is important to help those whose positions are being phased out to become educated in skills that will enable them to acquire new jobs.

“With these innovations, comes the needs to re-train and up-skill workers,” says Douglass. “That’s where the challenge lies.” Despite inevitable loss of some menial tasks due to

continued on p. 30

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100 YEARS AMERICAN WELDING SOCIETY

The American Welding Society was founded in 1919 in Philadelphia, Pennsylvania, with a mission to meet a national need to support welding during World War I. President Woodrow Wilson had asked Harvard Professor Comfort Avery Adams to chair the Welding Committee of the Emergency Fleet Corp., which was merged with the National Welding Council to form AWS. Adams served as the first president of the Society.



The objectives of the newly formed society were, "To advance the science and art of welding in all the branches. To afford the members the opportunity for the

interchange of ideas with respect to improvements in the welding art, and for the discus-



First Annual Dinner American Welding Society, Reizenweber's, New York City, April 26, 1922.



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sion of all matters bearing upon the practice of the art of welding, and for the publication of information thereon."

Now, 100 years later, the mission of the AWS has stayed remarkably similar. Today's global mission is to "advance the science, technology and application of welding and allied joining and cutting processes, including brazing soldering and thermal spraying. AWS strives to move the industry forward in both thought and action, as well as inspire new generations to see the exciting career opportunities available today."

"Since its inception in 1919, both the technology of welding and AWS as its major proponent have come a long way," says AWS Interim Executive Director Ray Shook. "The next century promises to deliver even greater advancements in the science of materials joining."

Some of the milestones for the Society in its century of existence include: the publication of the Welding Journal in 1919, a publication which still exists today, the

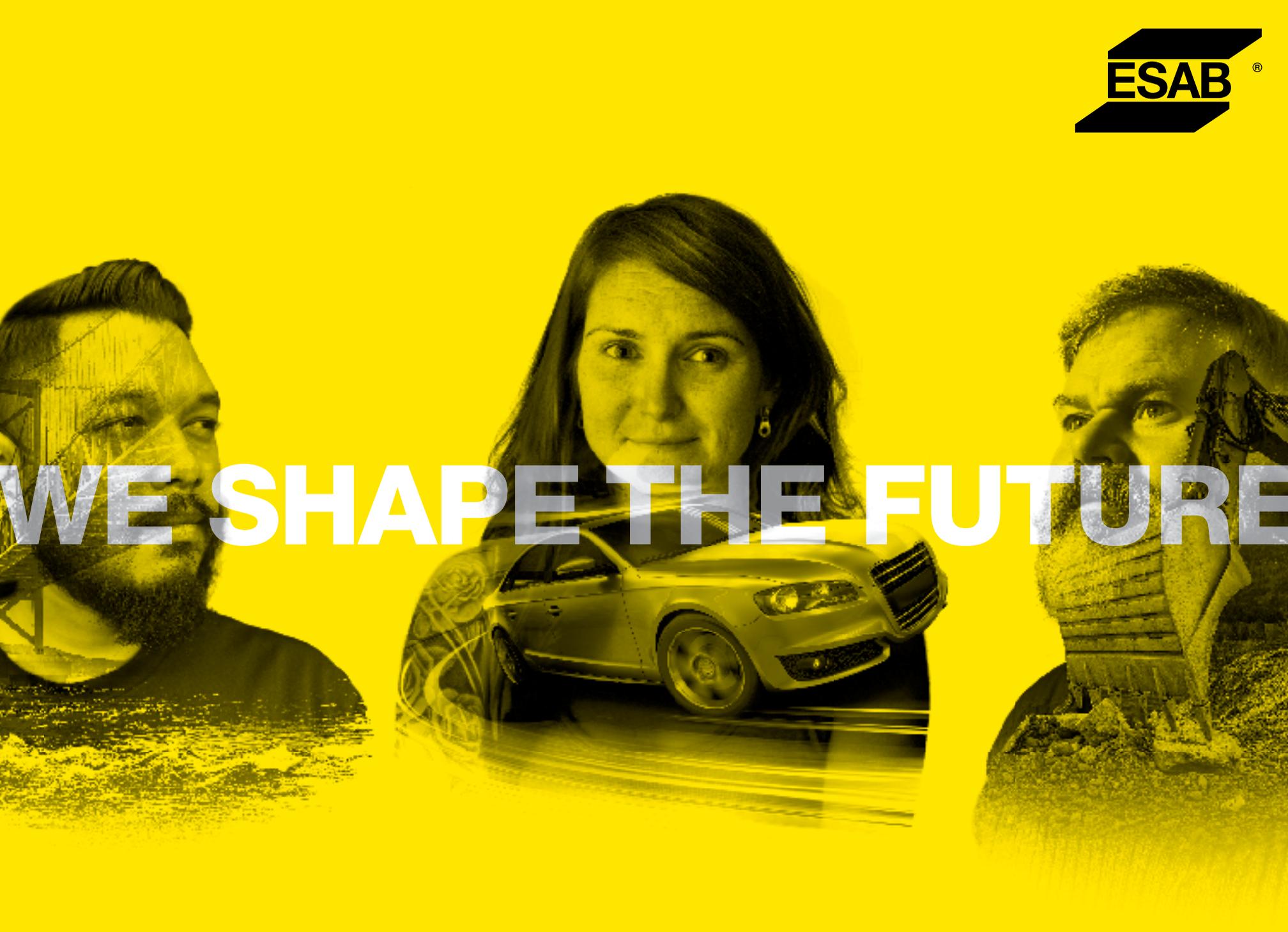


first AWS meeting in 1922, the moving of its global headquarters to Miami, Florida, membership eclipsing 70,000 members, the introduction of the AWS Welding Handbook and the launching of the AWS Annual Show, since merged with FABTECH, which hosted more than 48,000 attendees in 2017.

"AWS is proud of its role in advancing the science, technology and application of welding over the past century," says Shook. "And, yet, we know our most important contributions are ahead of us. As the premier member-based welding society worldwide, AWS is keenly aware of the role it must play in the science and application of materials joining. We take that job seriously and see great things ahead of us in the next century." ■

Reprinted from GAWDA Media.



A photograph of three people—a man on the left, a woman in the center, and a man on the right—looking towards a silver car. The car is positioned in the center of the frame, and the background is a bright, yellowish-green gradient. The text "WE SHAPE THE FUTURE" is overlaid in large, white, bold letters across the middle of the image.

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Get schooled at ESAB University (in partnership with Weld.com), a dedicated area within the booth featuring multiple daily educational sessions by welding experts. Plus, you'll have the opportunity to meet and learn from Ian Johnson and the ESAB Elite team.

Visit booth B17087 and come see how we can build the world of tomorrow, together.

Meet Barbie the Welder This Week at FABTECH

Barbie Parsons, professionally known as Barbie the Welder, is a full-time metal sculptor from Erin, NY. Even though she had no business experience or professional art education, Barbie's unique, self-taught style quickly threw her into the spotlight on social media where she caught the eye of individuals and

major corporations alike. To date she has designed and created sculptures for Weiler Abrasives, Miller Welders, Harley Davidson, Carolina Shoe Company, and exclusive clients in 14 countries. Barbie has also inspired and taught thousands of people how to weld art through her two books, Horseshoe Crafts, and

How to Weld Silverware Animals, and through her YouTube channel where she shares How To Weld Metal Art videos and live-streams her sculpture creation.

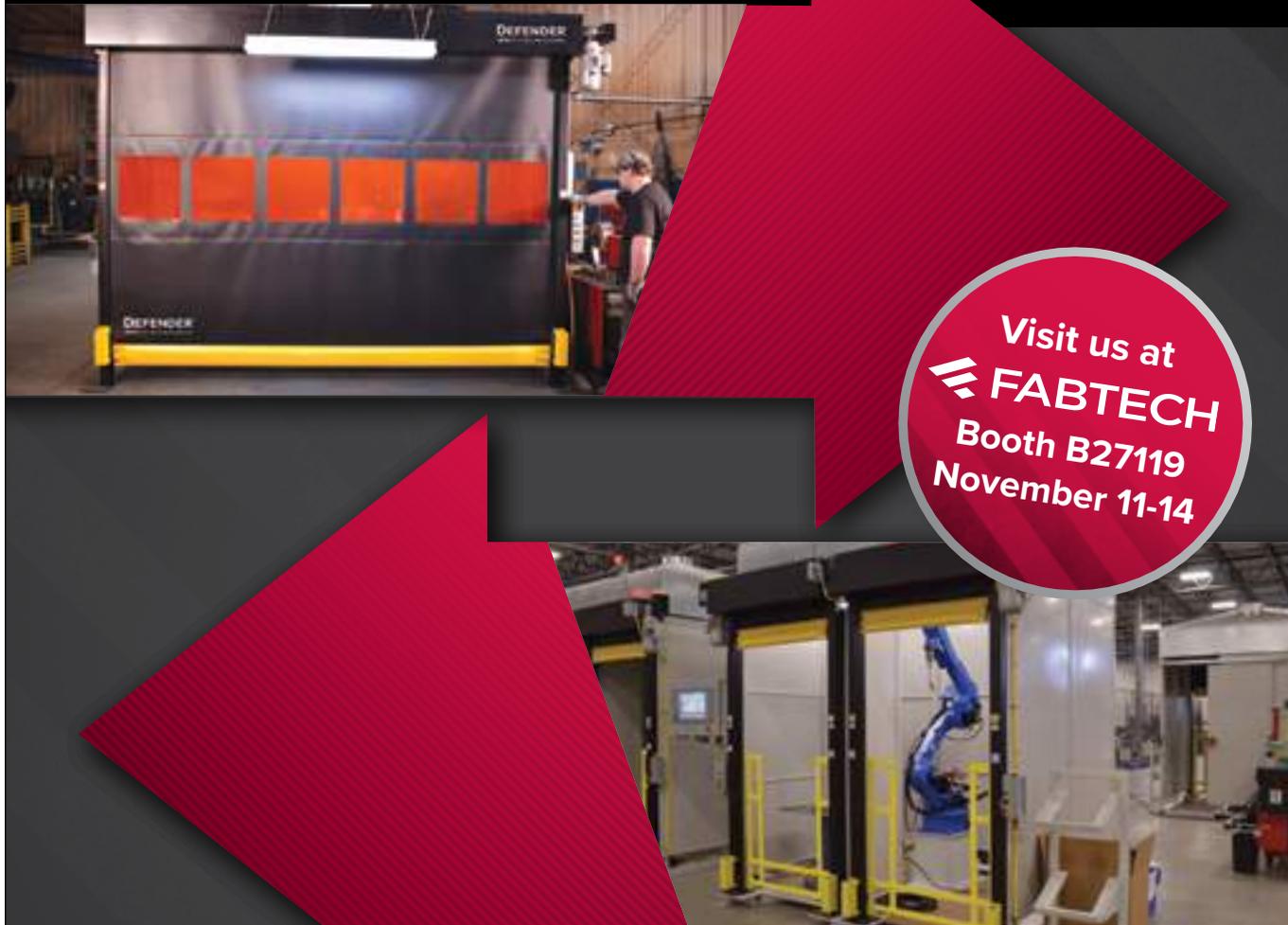
Barbie has welded sculptures live for audiences at shows and events including Americade Motorcycle Rally, Ridgway Chainsaw

Carvers Rendezvous, Sturgis Motorcycle Rally, and SEMA Show in Las Vegas. We are very honored and excited to say that she is also making a grand appearance at FABTECH!

Barbie will be on the show floor for all four days of FABTECH sharing her amazing art and motivational stories. She will be visiting Encompass Machines, booth B19104, Weiler Abrasives, booth B33031, Miller Electric, booth B23054, and more!

Visit BarbieTheWelder.com to view her sculptures and connect with Barbie the Welder on Instagram, Facebook, LinkedIn, and YouTube to see what she does next! ■

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Are You an Arc Junkie?

Visit Jimmy McKnight at FABTECH

Jimmy McKnight is the host of **Arc Junkies Podcast**. A Detroit-based blue collar talk podcast that promotes welding and skilled trades and motivates its listeners to become elite not only in skill, but in business and life. As a welder of 16 years, Jimmy's real-life experience and raw and uncensored commentary has resonated with and is downloaded by thousands of welders weekly from around the world.

Arc Junkies will have four live shows kicking off FABTECH each morning at ESAB Welding & Cutting Products, booth B17087. They will also have a final 5th live show on Thursday at Arc-Zone.com Inc, booth B25117. With guests ranging from welding students to TV personalities and insights from the industry's top professionals, Jimmy has grown Arc Junkies Podcast from a simple idea into a global welding entertainment powerhouse that continues to entertain and inspire welders young and old on a weekly basis. Be sure to get to the shows early as seats fill up fast, you won't want to miss this!

Be sure to check out the podcast on arcjunkies.com, and follow on Facebook, Instagram, and Twitter @ [arcjunkiespodcast](https://twitter.com/arcjunkiespodcast). ■

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Are You the Best Welder at FABTECH?

The American Welding Society (AWS) Welding Competition is looking to determine who is the best welder at FABTECH 2019.

With the show attracting some of the top welders on the planet, there is some prestige attached to winning this event. Participants go head-to-head in completing and cleaning a single-pass fillet weld. But it must be done perfectly in less than five minutes. Both speed and accuracy count, and weldments are eval-

uated against AWS D1.1 by a distinguished panel of Certified Welding Inspectors (CWI).

So ... are you game? Do you think you can lay a bead better than the rest? Can you weld more accurately and faster than anyone else in the nation? Can you see yourself being crowned as the best welder at FABTECH?

If so, the qualification for the competition are simple: You must be 18 years or older and

weld for a living. If you qualify, visit Booth B17116 on Monday (10:00 AM – 5:00 PM) or Tuesday (9:00 AM – 4:00 PM) and demonstrate your skills.

If you really are that good, you could win up to \$1,200. But be warned, competition is stiff. You will be up against some of the best welders on the continent.

Each day, the judges will select the top





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twenty candidates based on weld size and overall appearance. A laser profiler will then place the top 12 in sequence from best to worst. Additional NDE may be performed at the discretion of the judges to determine the overall winner.

As well as a top prize of \$1,200, second place earns \$500 and third place is given \$250. Even if you don't win, anyone making it into the top twelve will earn an AWS swag bag and an education services t-shirt.

So, visit Booth B17116 during the show on either Monday or Tuesday, complete an entry form and pay a \$15 participation fee. If desired, welders may compete on both days and as many times as they wish. A new entry form and fee is required for each attempt. The daily competition concludes one hour before the show floor closes. Winners are announced at that time. Entrants must be present (5:00pm Monday and 4:00pm Tuesday) to collect their winnings. ■

FABTECH *Bistro*



Reserve a seat at the FABTECH Bistro and you will always have a convenient place to eat, meet and network.

The Bistro offers assorted menu options including fresh and healthy lunch options, all at a reasonable price.

Pre-purchase your individual lunch tickets to avoid the lines.
Visit the Bistro Counter on Level 2.5.

TWO LOCATIONS:

- Ballroom S100
- Lakeside Center

CCAI Offers Hands-on Finishing Opportunities at FABTECH

This year, the Chemical Coaters Association International (CCAI) (B13026) provides FABTECH visitors with multiple ways to experience finishing first-hand. 2019 marks the third consecutive year of the FAB to FINISH Production Experience which offers attendees the opportunity to experience part production from fabrication to finishing.

Mazak Optonics will laser cut parts designed specifically for the FAB to FINISH program. After watching the part being cut, participants each receive one souvenir part as well as a card which explains the subsequent process steps. Participants will take their part to the



Finishing Pavilion, as directed by their card, to have their part pretreated in preparation for powder coating. Next, they will be able to powder coat the part themselves and before observing the final step in the process, curing. Once the part is cooled, they can take the souvenir part home with them.

The FAB to FINISH experience is open to all FABTECH attendees. To accommodate as many people as possible, participation is limited to one part per person. Attendees can pick up an instruction card at CCAI (Booth B13026) or Mazak Optonics (Booth A4202) that will provide the participating company booth numbers and directions outlining the production flow attendees should follow.

Exhibitors participating in the FAB to FINISH Production Experience include:

- Mazak Optonics (A4202)** – part design & laser cutting
- Chemetall US Inc. (B15023)** – pretreat
- DuBois Chemicals Inc. (B15029)** - pretreat
- GAT Systems (B15036)** – pretreat
- Gema USA (B13034)** – powder coating
- IFS Coatings Inc. (B15026)** – powder coating & curing
- Keyland Polymer Material Sciences LLC (B12033)** – powder coating & curing
- Nordson Corporation (B13018)** – powder coating & curing
- Trimac Industrial Systems (B12017)** – curing

In addition to the FAB to FINISH Production Experience, visitors to the CCAI booth (B13026) can try their hand at industrial painting using the VP3D system from Virtual-Paint™. The VP3D is a virtual reality training system that takes hands-on training out of the spray booth and into the classroom.

The system integrates commercially available third-party hardware, custom spray gun controllers and software products. System operation integrates a spray gun controller, motion tracking and research-based software to calculate performance feedback. The system is environmentally friendly as it completely eliminates hazardous air emissions, waste and resource consumption.

Be sure to stop by the CCAI Booth B13026 and try out your industrial painting skills. ■



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Get Connected with TRUMPF at FABTECH Booth A2904

At FABTECH 2019, TRUMPF is showcasing its cutting-edge technology in booth A2904. All the latest offerings from TRUMPF's innovative fabricating machinery portfolio are on display including the new TruBend 7050. New machine features and automation will also be demonstrated at the show. In addition, the TruServices team will be on hand to discuss

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

TruLaser: Laser Processing

The TruLaser 5030 fiber introduces significant new features for higher productivity to

go along with the machine's robust 10-kilowatt TruDisk laser. TRUMPF's new Active Speed Control feature enables the system to look straight through the nozzle right at the cutting zone, monitoring it in real-time, autonomously controlling the feed rate of the machine. Smart Nozzle Automation with TRUMPF's new QuickSwap feature will also

be demonstrated on the TruLaser 5030 fiber. QuickSwap allows operators to replenish nozzles during the cutting process without interruption via a drawer that extends outside of the machine. The TruLaser 1030 fiber with a LiftMaster Compact and PartMaster can also be viewed in the TRUMPF booth.

TruLaser Tube 7000 Fiber:

TRUMPF's TruLaser Tube 7000 fiber is designed for fast and flexible processing. The open machine concept gives the TruLaser Tube 7000 fiber optimal accessibility during loading and unloading. Also, with RapidCut, the high feed rates of the laser are noticeable even on smaller contours. The machine utilizes a 4-kilowatt TruDisk laser which allows users to process parts with a diameter of up to 10 inches. TRUMPF in conjunction with FEHR provides both standalone and automated storage and loading solutions that minimize customer material handling, eliminate safety issues, optimize floor space utilization and enable complete control of inventory to reduce overall processing costs.

TruMatic 1000 Fiber:

The TruMatic 1000 fiber, known for its compact size and wide range of capabilities, increases the range of automated production with the SortMaster Compact. The combination punch and laser machine pairs a "flying" delta-drive punching head featuring all-tool rotation with a 3-kilowatt TruDisk laser. Together they perform an unparalleled range of processes from punching and forming, to tapping and laser cutting, reducing handling and eliminating secondary operations. Automation offerings include a SheetMaster Compact, which loads and removes full sheets and the new SortMaster Compact, introduced at FABTECH. The SortMaster Compact removes, sorts and stacks individual parts up to 24" x 16" and up to 33 lbs. Requiring almost no additional floorspace, the SortMaster Compact deposits the parts to an easily accessible location in front of the machine. ■

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Thursday - Day 4: Meet **Mike Taylor** from Keybar

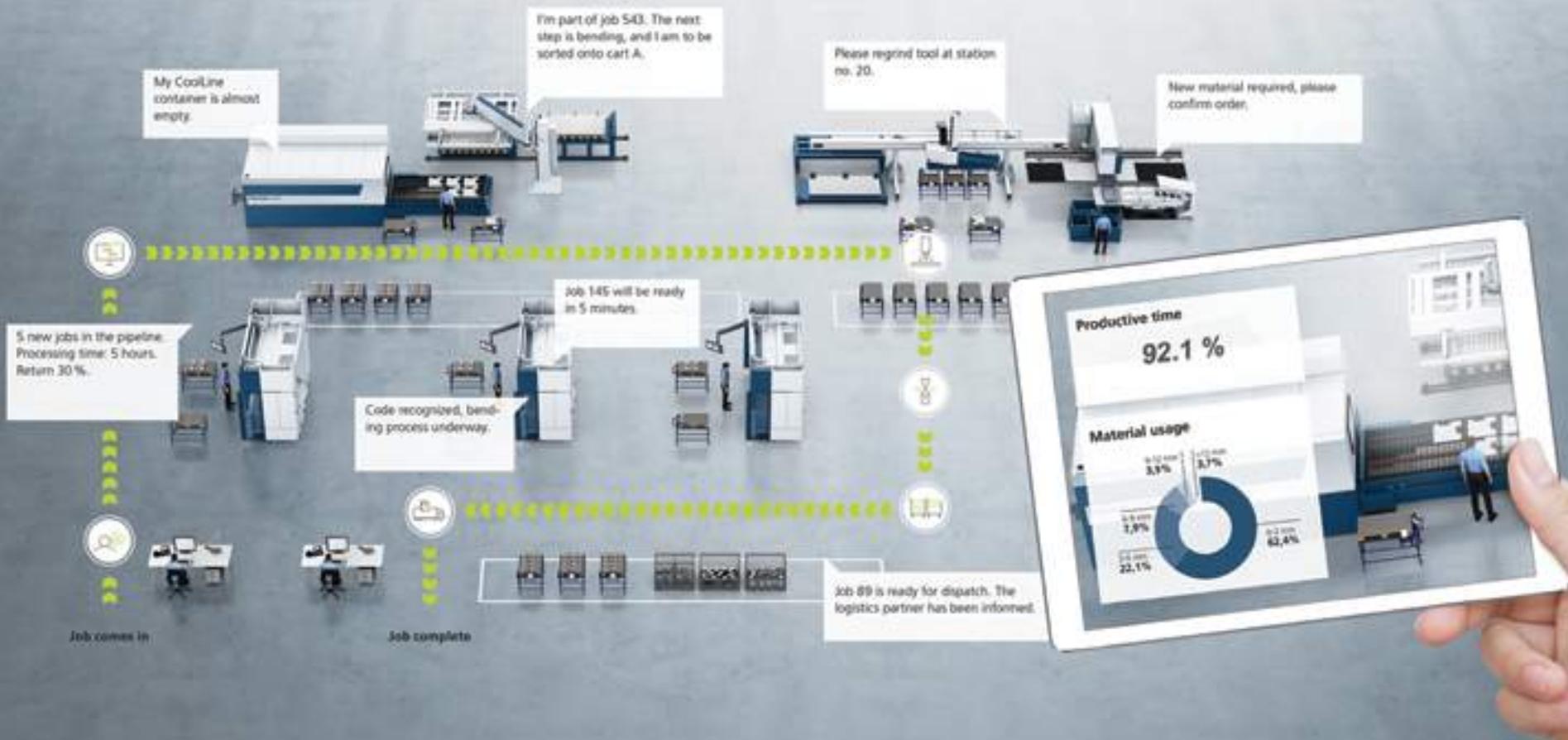
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State of the Industry: Automation in Manufacturing continued from p. 21

robotics, Douglass believes the impact of robotics on human workers will be positive. He points out that robots have been used in factories for decades.

“New innovations in robotics will allow human workers to better work collaboratively with robots on the factory floor, empowering workers rather than displacing them,”

says Douglass. “Robots will continue to be used for tasks that require precise, repetitive motions, freeing human workers to do more satisfying and safer tasks.”

So how will this play out in terms of worker replacement and job loss? What tasks are likely to be lost to workers and which are they likely to retain? In the industries where robots

have been deployed, namely automotive and logistics, employment has increased in the past decade, says Douglass.

“Workers are doing new and different tasks while robots are working alongside their human counterparts and completing the dull, dirty, and dangerous tasks,” he says. “Automation and robotics will ultimately

lead to safer working conditions as robots continue completing tasks that require precise movements.”

Robotics, for example, will be used to take care of repetitive tasks. Instead of a worker standing at a press and making the same motion for hours on end, a robot can take over the job and perform it with precision and far greater speed than a human.

Similarly, robotics can be used to deal with highly complex motions across multiple axes. For example, a well-programmed robot can cut a part from metal in a short time without fear of sparks, heat, or other potential dangers.

It makes sense, then, to introduce robotics where they are most needed. Human operators can be freed up to do more engaging work that doesn't require hours on end either carrying out the same action or subjecting themselves to dangerous conditions.

Automation Challenges

But the broader introduction of robotics and automation will bring challenges. Douglass says the first major hurdles are gaining an understanding of where to begin and what to do first. He will explain to attendees where they can gain the most benefit from robotics for the greater return on investment (ROI). Instead of trying to automate an entire manufacturing plant or job shop, it might be better to identify an area where robotics can raise productivity and revenue immediately. Wherever the ROI is highest, prioritize the introduction of robots in those areas.

“A big challenge facing automation is cost justification and understanding what type of automation will work best for your company,” says Douglass. “These challenges are particularly staggering for small manufacturers.”

Douglass will outline ways for manufacturers to reduce the risk involved in technology implementation on the factory floor. Due diligence, working with trusted partners and good systems integrators, he thinks, will help to lower the risk of investment in robotics and automation.

Don't miss the State of the Industry: Automation in Manufacturing Panel Session, Tuesday, November 12 at 12:30 PM in the Lakeside Center Ballroom. ■



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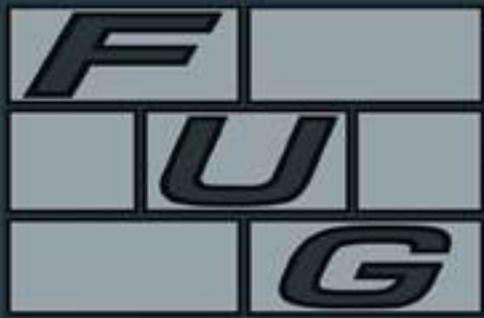
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