

# Advance

ACCELERATE  
YOUR CAREER  
AND YOUR  
BUSINESS AT  
FABTECH 2018

ATLANTA  
NOV 6-8

REGISTER TODAY  
[FABTECHEXPO.COM](http://FABTECHEXPO.COM)

## EVENT PREVIEW



# FABTECH

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

Thank You to Our Platinum Sponsors



### INSIDE:

- EXHIBITOR LIST
- SPECIAL EVENTS
- SCHEDULE-  
AT-A-GLANCE
- EDUCATION  
PROGRAMS
- HOTEL AND  
TRAVEL
- PLANNING  
TOOLS



# GET CONNECTED with TRUMPF



FABTECH is the perfect opportunity to get connected with TRUMPF. We invite you to stop by our booths to see our latest selection of machine technology, automation, software and services. Talk with our experts and learn how a smart connection with TRUMPF can keep you ahead of your competition. With 3 booths, 9 production technologies and 13 machines in operation, we hope to have what it takes to make your fab shop a digital success.

**FABTECH Booths B5609, B6309, C10574 / [www.trumpf.com](http://www.trumpf.com)**

Punch/Laser – Laser Cutting – 3D Laser Processing – Tube Laser Cutting – Bending – Automation – Additive Manufacturing – Laser Welding – Laser Marking – Power Tools – Software – Financing – Technical Services

# TABLE OF CONTENTS

General Information . . . . . 4-5

Exhibitor List . . . . . 6-11

Special Events . . . . . 12-14

## Tuesday Keynote:

FABx Tech Talks . . . . . 12

Expert Panel Presentation:  
Innovate, Accelerate and  
Advance Manufacturing . . . 12

**Industry Night at  
Mercedes-Benz Stadium . . . 12**

**Women of FABTECH**  
Breakfast with Tech Tour . . . 13

**Wednesday Keynote:**  
Kyle Petty, NASCAR Icon  
and Philanthropist . . . . . 13

State of the Industry . . . . . 13

**RUN4MFG 5K . . . . . 13**

**Thursday Keynote:**  
Make Way for Gen Z! . . . . . 14

Expert Panel Presentation:  
Manufacturing and the New  
Generation Workforce . . . . 14

**Knowledge Bar:**  
Ask the Experts . . . . . 14

**Smart Manufacturing Hub . . 14**

**About the Program . . . . . 16**

**Schedule-at-a-Glance . . . . 17-19**

**Pricing Information . . . . . 20**

## Education Program

**Tracks . . . . . 21-45**

3D/Additive  
Manufacturing . . . . . 21

Automation . . . . . 21-22

Cutting/Laser . . . . . 23

Finishing . . . . . 24-25

Forming &  
Fabricating . . . . . 26-27

Lean . . . . . 27

Management . . . . . 28

Marketing & Sales Tools . . . 29

Smart Manufacturing . . . . . 30

Stamping . . . . . 31

Welding Fabrication . . . . . 32

Workforce  
Development . . . . . 33-34

Welding . . . . . 36-45

Seminars  
RWMA School  
Career Path Workshops  
Professional Program  
Education Sessions  
AWS Society Events

**Hotel & Travel . . . . . 46**



## LOCATION

### Georgia World Congress Center

285 Andrew Young International Blvd NW  
Atlanta, GA 30313

## LEARN

Gain valuable, can't-miss insights from best-in-class education and training programs that target technical, operational and managerial segments.



## CONNECT

Visionary keynotes, expert panels and other special events allow attendees to network with peers, exchange best practices and learn about the latest industry advancements.



## COMPARE

Discover advanced technologies that improve quality and productivity, and compare innovative solutions from more than 1,500 exhibitors side-by-side.



### Event Preview Volume 7, Issue 1, August 2018

The Event Preview is published annually on behalf of FABTECH<sup>®</sup> by The Fabricators & Manufacturers Association, International<sup>®</sup>

2135 Point Blvd | Elgin, Illinois 61023 USA  
815-399-8700 | fmanet.org | fabtechexpo.com

# ACCELERATE YOUR CAREER AND YOUR BUSINESS AT FABTECH 2018

Whatever you need to advance and move forward, you'll find it here. Only FABTECH offers you direct access to the innovation, education and collaboration you can use to accelerate your career and your business.

Register to attend at  
**[fabtechexpo.com](http://fabtechexpo.com)**



## FABTECH 2018 FEATURES



**1,500**  
Exhibitors



**130+**  
Educational  
Sessions



**650,000**  
Net Square  
Feet of  
Exhibits



**500+**  
New Products  
& Live Equipment  
Demonstrations



Daily Keynote  
Presentations  
and Panel  
Discussions



**35,000**  
Attendees

### SHOW HOURS

**Tuesday, Nov. 6**  
10:00 AM - 6:00 PM

**Wednesday, Nov. 7**  
9:00 AM - 5:00 PM

**Thursday, Nov. 8**  
9:00 AM - 4:00 PM

### REGISTER TO ATTEND

Avoid lines onsite and a \$50 admission fee by registering today online at **[fabtechexpo.com](http://fabtechexpo.com)**.

### SHOW ADMISSION

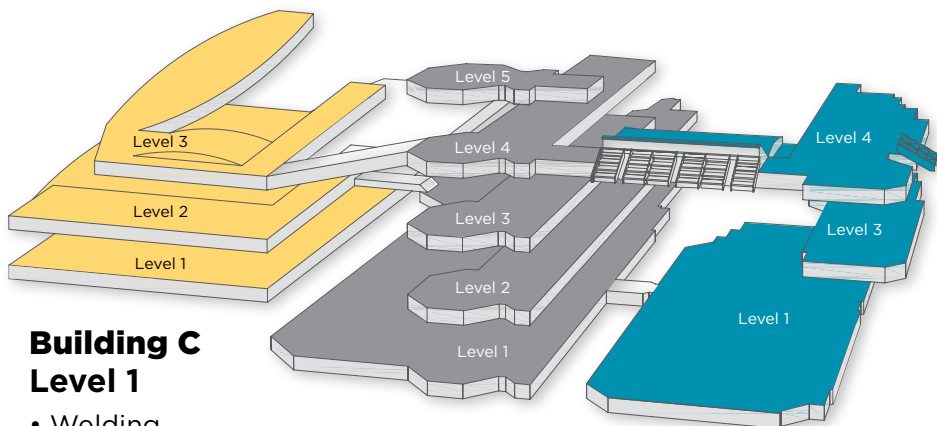
Exhibit-only registration is **FREE** through November 2, 2018. Beginning November 3, the cost to attend the exhibits is \$50. AWS, FMA, SME, PMA and CCAI members may always attend the exhibits for **FREE** with proof of membership.

## TECHNOLOGY ON DISPLAY

- 3D/additive manufacturing
- arc welding
- assembly
- bending & forming
- brazing & soldering
- business services
- coil processing
- cutting
- fastening & joining
- finishing/paint & powder coating
- finishing/plating
- gases & gas equipment
- hydroforming
- inspection & testing
- job shop/contract manufacturing
- lasers
- lubrication
- maintenance & repair
- material handling
- metal suppliers



## GEORGIA WORLD CONGRESS CENTER



### Building C Level 1

- Welding
- Tube & Pipe

### Building B Level 1

- Fabricating
- Finishing
- 3D/Additive Manufacturing

### Building A Level 1

- METALFORM
- Fabricating
- Welding

- plate & structural fabricating
- press brakes
- punching
- resistance welding
- robotics
- roll forming

- safety & environmental
- saws
- software/machine controls
- stamping
- thermal spraying
- tool & die
- tooling

- tube & pipe fabricating or welding
- tube & pipe producing
- waterjet
- welding consumables
- welding machines

# EXPLORE EQUIPMENT AND SERVICES FROM LEADING COMPANIES

Exhibitor list by pavilion as of 07/02/18. Visit [fabtechexpo.com](http://fabtechexpo.com) for a complete exhibitor list.

## 3D/ADDITIVE MANUFACTURING

3D Metal Printing Magazine  
3D Systems  
Additive Manufacturing  
Advanced RP  
Alpha Laser - US  
Cincinnati Inc  
Creaform  
Desktop Metal  
DisTech Automation Inc  
EnvisionTEC Inc  
Fusion3  
Laserline Inc  
Markforged  
Matterhackers  
MicroCare Corporation  
Nanogrande Inc  
Novatech  
Oak Ridge National Laboratory  
Prototyping Solutions  
Protolabs  
Renishaw Inc  
Shining 3d  
SimuTech Group  
SPI Lasers  
Stacker LLC  
Stratasys  
SWECO  
TriMech  
TRUMPF Inc  
TUV Rheinland  
Ultimaker  
Vention  
Wisconsin Precision Casting Corp  
Xact Metal  
Xometry

## FINISHING

1st Source Products Inc/  
Tycon Bearings  
ABL Technic NA  
Accudraft Spray Booths  
ACT Test Panels LLC  
AFC Finishing Systems  
Air Power Inc  
AkzoNobel Powder Coatings  
Alabama Washer & Oven Co  
Alconox  
Alexandria Metal Finishers  
Alliance Manufacturing Inc  
Amberica Inc  
AMOVA SARL  
APEL International  
Argon Masking Corp  
ASCO Carbon Dioxide Inc  
Assured Testing Services  
Axalta Coating Systems  
AZZ Metal Coatings

## FINISHING

Baril Coatings USA  
BASF Corp  
BCI Surface Technologies  
Bulk Chemicals Inc  
BEKO Technologies  
Bex Spray Nozzles  
Blast Cleaning Technologies  
Blast Services Inc  
BlastOne  
Burleigh Industries  
Calvary Industries Inc  
Canadian Finishing & Coatings Manufacturing  
Caplugs  
Carlisle Fluid Technologies  
Castrol  
Catalytic Industrial Systems  
Chemetall US Inc  
Chemical Coaters Assoc International  
Chemtec North America LLC  
Clean Air Technology Solutions  
ClearClad Coatings LLC  
Clemco Industries Corp  
Col-Met Engineered Finishing Solutions  
Columbus Industries Inc  
Combustion and Systems Inc  
Coral Chemical Co  
CPR Systems  
Custom Fabricating & Supplies  
D & B Plating  
Decoral System USA Corp  
Defelsko Corp  
Delfin Industrial  
Diamond H2O  
Dinamec Systems  
DMP Corporation  
DuBois Chemicals Inc  
Duroair Technologies Inc  
Dürr Systems, Inc  
DV Systems Inc  
Dynabrade Inc  
Echo Engineering  
Eisenmann Corp  
Elcometer Inc  
EnviroServe Chemicals Inc  
EPSI Engineered Products & Services Inc  
Ervin Industries  
ESMA Incorporated  
Euroimpianti Srl  
Eurosider SAS Di Milli Otovio  
FAMIS Incorporated  
Fandeli Coated Abrasives  
FANUC America Corp  
Fischer Technology Inc  
Flex Trim USA

## FINISHING

Fluke Process Instruments  
Fostoria Process Equipment Div of TPI Corp  
Frost Inc  
GAT Finishing Systems  
Gema USA Inc  
General Fabrications Corp  
George Koch Sons LLC  
Global Finishing Solutions  
GMA Industries Inc  
Goff Inc  
GPA INNOVA-DLyte  
Graco Inc  
Graphic Products  
HafcoVac  
Hammond Roto-Finish  
Hedson Technologies North America  
Henkel Corp  
Hentzen Coatings Inc  
Heraeus Noblelight LLC  
Herr Industrial Inc  
Houghton International Inc  
Hubbard-Hall Inc  
IFS Coatings Inc  
Infiniti Coating Solutions  
INTEK Corporation  
IntelliFinishing  
International Thermal Systems LLC  
INTERTEK  
Iowa Area Development Group  
IST America  
IST International Surface Technologies  
IXS Coatings  
Jackson Oven Supply  
Jamestown Coating Technologies  
Jervis B Webb Co  
Keyland Polymer Material Sciences LLC  
Klinger Paint Co  
LDPI Inc  
LPI Inc  
LS Industries Inc  
Magic Rack/Production Plus Corp  
MAXAIR Systems  
Midwest Finishing Systems  
Mighty Hook Inc  
Mighty Lube Systematic Lubrication Inc  
ML Filters  
Mode Kartela Boya Ltd Stl  
NikoTrack LLC  
Nordic Air Filtration  
Nordson Corp  
Novacel  
Omnirobotic  
Parker Ionics

## FINISHING

Patriot Metal Finishing Systems Inc  
Peening Technologies  
PEM Inc  
Pneu-Mech Systems Mfg  
Pollution Control Products Co  
Polymer Molding Inc  
Porcelain Enamel Institute Inc  
Powder Coated Tough  
Powder Coating  
Powder Coating Institute  
PPG  
Precision Color  
Products Finishing Magazine  
Prona Tools Inc  
Raptor Blasting Systems  
Richards-Wilcox Conveyor  
Rohner  
RollSeal Inc  
S.E.F. ITALIA SRL  
Sames Kremlin  
Sata Spray Equipment  
Scheugenpflug Inc  
Selas Heat Technology  
Sherwin-Williams  
sia Abrasives  
Sigma Abrasives North America  
Southern Equipment & Services  
Southern Fluid Systems  
Spray Systems Inc  
Spray Tech/Junair  
Spraying Systems Co  
Sprimag Automated Coating Systems  
SUNKISS-EPI Inc  
System Technologies  
Tanis Inc  
TCI Powder Coatings  
Technotrans America  
The Electrocoat Association  
Therma-Tron-X Inc  
Transmet Corp  
Trimac Industrial Systems  
UniCure Spraybooths  
Uni-Spray Systems Inc  
V&S Galvanizing LLC  
Valmont Coatings  
Vapor Technologies  
Viking Blast & Wash Systems  
Vitracat America Inc  
voestalpine eifeler coatings  
Vogel Industrial Coatings  
VULKAN Blast Shot  
W Abrasives

## FINISHING

Wagner Systems Inc  
Washington Mills Ceramics  
Webb-Stiles Co

## FORMING & FABRICATING

1st Source Products Inc  
3D Fab Light Inc  
3DCap Custom Headwear  
Accurate Technology Inc  
Accurpress  
Adira  
Advance Cutting Systems  
Advanced Process Optimization Inc  
AIM Inc  
Ajan Elektronik Servis Sanayi Ve Ticaret Ltd St  
AKS Cutting Systems Inc  
Akyapak Makina San Ve Tic Ltd STI  
Alabama Economic Development (NAIDA)  
Al-Fe Heat Treating Inc  
Alliance For American Manufacturing  
Alliance Machine and Engraving LLC  
Allied Machine & Engineering  
Allied Powers LLC  
Allor Manufacturing Inc/  
Plesh Industries  
Allstrap Steel & Poly Strapping Systems  
Alma CAM USA LLC  
Almetals Inc  
Alpha Precision Group  
Alternative Parts Inc  
AM Machinery Sales Inc  
Amada America Inc  
Ambrell Induction Heating Solutions  
American Cutting Edge  
American Photonics  
American Punch Co  
AMS Controls Inc  
ANDRITZ Herr-Voss Stamco Inc  
Anhui Huatian Mechanic Co Ltd  
AP Lazer  
Apex Machine Group  
Aptek Inc  
Armstrong Kover Kwick Inc  
Arro-Mark Co LLC  
Arrowhead Manufacturers & Fabricators Assoc  
ASKO Inc  
Athader  
Atlanta Drive Systems Inc  
Autodesk Inc

**FORMING & FABRICATING**

Automated Layout Technology  
Automec Inc  
AVEVA Inc  
AXOOM GmbH  
Barton International  
Beagle I Inc  
Beck Automation  
Beckhoff Automation  
Behringer Saws Inc  
Beta Tools USA  
Betenbender Manufacturing Inc  
Big Ass Fans  
Big Steel Rack  
Binder USA LP  
Black Hills Corporation  
Blastec Inc  
Blue Water Engineering Pty Ltd  
Boeck GmbH  
BOFA Americas Inc  
BOLDRINI  
Bonak CPL SL  
Bosch Rexroth Corp  
Boschert Precision Machinery Inc  
Boss Laser  
Boss Manufacturing Co  
Bowlin Manufacturing Inc  
Bradbury Group Australia  
Bradbury Group PuMa  
Bradbury Metal Tile Roofing Solutions  
Braner USA Inc  
BTM Company LLC  
Buds Equipment Sales  
Burghardt + Schmidt Group  
Burnco Mfg Inc  
Burr King Manufacturing Co  
Bushman Equipment  
Butech Bliss  
BUWW Coverings Inc  
Bystronic Inc  
C2AE Architecture + Engineering  
Cambco  
Cameron Mfg and Design  
Camlock Systems Inc  
Capital One  
Carell Corporation  
Carmel Group Inc  
CH Steel Solutions Inc  
Chambrean SAS  
Changzhou City Wansui Tools Works  
Chase Cooling Systems  
Chicago Slitter  
CIDAN Machinery Inc  
Cincinnati Inc  
Cleveland Punch & Die Co  
Cleveland Steel Tool Co  
Closed Loop Recycling  
CMF

**FORMING & FABRICATING**

CMS North America Inc  
Coherent Inc  
COLE-TUVE Inc  
Combliff USA  
COMEQ Inc  
Control Laser Corp  
Control Works Inc  
Controlled Automation Inc  
Cortec Corp  
Coslen Saws  
Costa Sanders  
Cowles Tool Co  
CQT Kennedy LLC dba Kennedy Manufacturing  
CTD Machines  
Custom Quality Manufacturing  
Custom Rollforming Corp  
Cy Laser America  
D Cooper Works  
Daito Seiki Co Ltd  
Dake Corporation  
Dalmec Inc  
Darex LLC  
DAVI Inc  
DCM Tech Inc  
Dees Hydraulic Industrial Co Ltd  
DeeTee Industries Ltd  
Dener Makina San Tic Ltd Sti  
Design 2 Part  
Design Storage & Handling Inc  
Diamond Saw Works Inc  
Dimeco Coil Technologies Inc  
Dirinler Makina AS  
Diversified Transportation Services  
DMC Metal Finishing  
DoALL Sawing Products  
Donaldson Torit - Donaldson Company Inc  
Dongguan Glorystar Laser Technology Co Ltd  
Dongguan Maozhong Precision Hardware Co Ltd  
Doringer Cold Saws  
Doucet Machineries Inc  
Dr. Shrink Inc  
DropsA USA  
Dude Solutions  
Duo Robotic Solutions  
Durma North America Inc/ Durmazlar/Durma  
Dynex/Rivett Inc  
Eagle Bending Machines Inc  
Eastern Metal Supply  
Ebbco Inc  
ECI Software Solutions  
Econco/CPI  
EHRT North America  
ELG Metals Inc  
Elumatec North America Inc

**FORMING & FABRICATING**

Emmegi USA Inc  
Eos Business Surveillance Solutions  
Epicor Software Corp  
Epilog Laser Corp  
EquipNet Inc  
Ercolina - CML USA Inc  
Ergo Advantage  
Ergotronix  
ERIEZ  
Ermaksan Makina San Ve Tic. AS  
ERP & Scheduling Software  
Euroboor USA  
ExhibitForce  
EXOR America  
Eyeconic.TV  
Fab Line Machinery Llc  
Fab Supply Inc  
Fabricating & Metalworking Magazine  
Fabricators & Manufacturers Assoc Intl (FMA)  
FabSuite LLC  
Faccin USA Inc  
Fagor Automation Corp  
Fairmont Concepts  
Family Business USA  
FARO Technologies Inc  
Fehr Warehouse Solutions Inc  
Felton Inc  
FF Journal/Modern Metals  
Ficep Corporation  
Fladder-Hansen & Hundebol Inc  
FlexArm Inc  
Flow International Corp  
Fluid Chillers Inc  
Fluke Corporation  
FomUSA  
Formdrill USA Inc  
Formtek Inc  
Foshan Beyond Laser Technology Co Ltd  
Fromm Packaging Systems  
Fujitsu Glovia Inc  
Gasparini SpA  
Gauer Metal Products Inc  
GE Mathis Co  
GenAlpha Technologies Inc  
Genius ERP  
Glen Dimplex Thermal Solutions  
Global Shop Solutions  
GMA Garnet  
GMC Machine Tools Corp  
Gorbel Inc  
Greenfield Industries Inc  
Guangzhou Cklaser Co Ltd  
H2O JET Inc  
Haas Automation Inc  
Haco-Atlantic Inc  
Haeger Inc  
HAEUSLER AG Duggingen

**FORMING & FABRICATING**

Hafendorfer Machine Inc  
Hangzhou Grand Imp & Exp Co Ltd  
Hangzhou Xiangsheng Abrasive Machine Manufacturing Co/ AME  
Hans Weber Sales and Service Corp  
Harmonic Drive LLC  
Hayes International  
Heck Industries  
HEM Inc  
Hexagon Manufacturing Intelligence  
Hiwin Corporation  
Hornet Cutting Systems  
Hougen Manufacturing Inc  
HUB Industrial  
Husky Rack & Wire  
Hyd-Mech Group Ltd  
Hydren Systems LLC  
Hypertherm CAM  
Hypertherm Inc  
Hyster Co  
igus Inc  
II-VI INFRARED  
IMSM Inc  
Industrial Info Resources  
Industrial Machine Trader  
Industrial Machinery Digest  
Industrial Magnetics Inc  
InfoSight Corp  
Innovative Components  
Inovatech Engineering  
Into-N2 LLC  
ISB  
ITEQ Vietnam Co Ltd  
Jepson Power Inc  
JETCAM-NestONE Solutions  
Jiangsu SUNSN Precision Tool Technology Co Ltd  
Jinan Bodor CNC Machine Co Ltd  
JMR Industrial  
Johnson Bros Roll Forming Co  
JPW Industries  
JS Products  
JWF Technologies  
KAAST Machine Tools Inc  
Kaka Industrial LLC  
Kasto Inc  
KB Duct - A CECO ENVIRONMENTAL COMPANY  
KD Capital Equipment LLC  
Keller USA Inc  
Ken Bergman & Assoc LLC  
Kennametal Inc  
Kern Laser Systems  
KeyedIn  
Keyence Corp of America  
Kinetic Cutting Systems Inc  
Kipp Inc

**FORMING & FABRICATING**

KMT Waterjet Systems Inc  
Kolev Engineering Inc  
Komatsu America Industries LLC  
LaCroix Precision Optics  
Laguna Tools  
Lantek Sheet Metal Solutions  
LAP Laser  
Laser Research Optics  
LaserStar Technologies Corp  
Laservision USA  
Lazer Safe Pty Ltd  
Leasing Resources Inc  
LENOX®  
Levitat Technologies Inc  
Lincoln Electric Co  
Linemaster Switch Corp  
LISSMAC Corp  
LT Ultra Precision Optics  
Lumentum  
LVD Strippit  
Machine Concepts Inc  
MachineMetrics  
Machinery Dealers National Assoc  
Made-In-China.Com  
Manufacturing Solutions  
Marion Die & Fixture Inc  
Marvel Manufacturing Co  
Master Magnetics  
Master Roll Manufacturing  
Mate Precision Tooling  
Mayer USA Inc  
Mazak Optonics Corp  
MB Metal Technologies LLC  
MC Machinery Systems Inc  
MCR Safety  
MD Metals  
MECCO  
Meltrich Corp  
Memex Inc  
Messer Cutting Systems  
Metal Supermarkets Service Company Inc  
MetalFinish LLC  
MetalForming Inc  
Metalix CAD/CAM Ltd  
MetaMation Inc  
Metform International Ltd  
Metsaw Systems Inc  
Metreel Inc  
MG Sri  
Microsoft Dynamics 365 - Turnkey Technologies Inc  
Midwest Automation  
Midwest Tool Inc  
MIE Solutions Inc  
Modula  
MPI Magnetic Products Inc  
MultiCam Inc  
Murata Machinery USA Inc

**FORMING & FABRICATING**

MVD Makina Sanayl A.S.  
 Nabtesco Motion Control Inc  
 Nadella Inc  
 Nano Purification Solutions  
 Nantong Reliant Trading Co Ltd  
 Neugart USA Corp  
 New London Engineering  
 Newport Corp  
 Nikola Labs  
 Nitto Kohki USA Inc  
 nLIGHT Inc  
 Nordfab Ducting  
 Norgren Automation Solutions LLC  
 Norlok Technology Inc  
 Nucor Buildings Group  
 Nucor Grating  
 Nukon USA  
 Oasis Scientific Inc  
 Ocean Machinery Inc  
 Oerlikon Metco (US) Inc  
 Ohio Laser LLC  
 OMAX Corp  
 OMCO  
 OmegaCube Technologies  
 Oncor  
 Orion Machinery North America Inc  
 Pacific Press Technologies  
 Packsize International LLC  
 Palmer Associates Inc  
 Pangborn  
 Pannier Corp  
 Paperboard Packaging Solutions  
 Paper-Less LLC  
 Park Industries  
 Parker Hannifin  
 Pat Mooney Saws  
 Patterson Fan Co  
 Peak Industrial  
 Peddinghaus Corp  
 Pensa Labs  
 PEP Technology  
 Perfection Global LLC  
 Peter Prinzing GmbH  
 Philippott Rubber/Lankhorst Mouldings  
 Phoenix Metals Co  
 Piranha  
 Pivatic Oy  
 Polyurethane Products Corp  
 Precision Saws Inc  
 Precitec Inc  
 Preco Inc  
 Premier Thermal Solutions  
 Prescor LLC  
 Press Brake Safety  
 Presto ECOA  
 Prima Power North America Inc  
 Project Tool & Die Inc  
 Prototyping Solutions

**FORMING & FABRICATING**

Onect LLC  
 Quantum Machinery Group  
 R&M Manufacturing Co LLC  
 Radan  
 Radian Laser Systems  
 RAS Systems LLC  
 RDI Laser Blanking Systems  
 Red Bud Industries  
 Replacement Brush Tables  
 Revolution Machine Tools  
 Rhino Cutting Systems  
 Rice Lake Weighing Systems  
 Richardson Electronics Ltd  
 Rigaku Analytical Devices  
 RIMCO Rotator  
 Rocklin Manufacturing Co  
 Rolled Alloys  
 Roller USA  
 Rollomatic Inc  
 Rose Graphix Inc  
 ROUND0  
 Rousseau Metal Inc  
 RWM Casters Co  
 Ryerson  
 SafanDarley BV  
 Sahajanand Laser Technology LTD  
 Salvagnini America Inc  
 Samco Machinery Ltd  
 Sandmeyer Steel Co  
 Sawblade.Com  
 SB Whistler & Sons Inc  
 Schelling America Inc  
 Schmalz Inc  
 Schneeberger Inc  
 Schneider Electric  
 Scotchman Industries Inc  
 SDS/2  
 Sea Gate International Inc  
 Senfeng CNC & Laser Technology USA Inc  
 Service Lamp Corp  
 Shanghai Sheetwell Metal Manufacture Co Ltd  
 Shanghai Shuheng Cutlery & Mould Manufacturing Co Ltd  
 Shiv OM Brass Industry  
 ShopBot Tools Inc  
 ShopData Systems Inc  
 Shoptech  
 SIC Marking USA Inc  
 SigmaTEK Systems LLC  
 signode  
 Sinto Surface Treatment  
 Slatpro LLC  
 SMA Sri  
 Smart Manufacturing Hub  
 SME  
 Snap On Industrial  
 Soitaab USA Inc  
 Spanco Inc

**FORMING & FABRICATING**

SSC Controls Co  
 SSI Schaefer  
 Stainless Shapes Inc  
 Stainless Structurals LLC  
 Starrett Company  
 Staub Manufacturing Solutions  
 Steel King Industries Inc  
 Steel Storage Systems Inc  
 Stop-Painting.com  
 Striker Systems  
 STRUMIS LLC  
 SUNS International LLC  
 Surface Armor LLC  
 SYSPRO ERP Software  
 TAB Industries LLC  
 Tapeswitch Corporation  
 Team Texas  
 TECHNI Waterjet  
 Technical Translation Services  
 The Bradbury Group  
 The Fabricator Magazine  
 The M.K. Morse Company  
 Three D Metals Inc  
 Tie Down Engineering  
 TigerStop LLC  
 TIGER-VAC USA INC  
 Timesavers LLC  
 Tinius Olsen  
 Tormach LLC  
 Travelers Indemnity Company  
 Trilogy Machinery Inc  
 Trimble Solutions USA Inc  
 Trim-Lok  
 TRUMPF Inc  
 TSI Inc  
 Tsune America LLC  
 Tulip Interfaces Inc  
 TW Metals LLC  
 TYKMA Electro  
 Ungerer Technology GmbH  
 UniPunch Products Inc  
 United Lens Co  
 UP! LLC  
 Urrea Professional Tools  
 Ursviken Inc  
 US Industrial Machinery Co  
 Verisurf Software Inc  
 Virtek Vision International  
 VKS - Visual Knowledge Share  
 Voortman USA  
 VyTek  
 Walker Magnetics  
 WARDJet Inc  
 Water Jet Sweden AB  
 Waterjet Warehouse LLC  
 Weil Engineering North America  
 Weima America Inc  
 Welser Inc  
 West Warwick Welding Co  
 Wila USA

**FORMING & FABRICATING**

Wilson Tool International  
 WM Caster  
 Workshops For Warriors  
 Wuko Inc  
 Wysong Parts & Service  
 Xinxiang Tianfeng Machinery Manufacture Co Ltd  
 Yarde Metals Inc  
 YESTOOL / Aloris USA  
**METALFORM**  
 Accurate Die Design Software Inc/Logopress3  
 Agathon Machine Tools Inc  
 AIDA-America Corp  
 Alma Machinery Co  
 Almco Inc  
 Alro Steel Corp  
 AP&T North America Inc  
 Apex Dynamics USA  
 ART Metals Group  
 ASC Machine Tools Inc  
 Associated Spring Raymond  
 Atlas Machine & Supply Inc  
 AutoForm Engineering USA Inc  
 Automated Tapping Systems  
 Azimuth Machinery  
 Bad Dog Tools  
 Balluff Inc  
 Beckwood Press Co  
 Berg & Co GmbH Spanntechnik  
 Bestar LLC  
 BesTech Tool Corp  
 Bihler 4Slide-Nc  
 Brown Boggs Machine Co  
 Bruderer Machinery Inc  
 BTD Tool & Die  
 Century Fasteners Corp  
 CIECO Inc  
 Clairon Metals Corp  
 COE Press Equipment Corporation  
 Colt Automation LTD  
 Concraft Holding Co Ltd  
 Dallas Industries Inc  
 DAYTON Lamina Corporation  
 DDI Inc  
 Delta Computer Systems Inc  
 Delta Industrial  
 DESCH Canada Ltd  
 DESTACO  
 Die Cad Group Inc  
 DieTronic  
 Dixie Industrial Finishing Co Inc  
 Dongguan Blacksmith Tool Co Ltd  
 Dongguan Changhong Metal Technology Co LTD  
 Dongguan Gooming Mechanical Co Ltd

**METALFORM**

Dongguan Lelin Tilledtek Metal Technology Co Ltd  
 Dongguan Shuang Shun Precision Mold Co Ltd  
 Dongguan SS JMP Tooling Co Ltd  
 Dongguan SYH Tooling Co Ltd  
 Dongguan Tai Qun Hardware Technology Ltd  
 Dongguan Vision Tool & Mould Co Ltd  
 Dongguan Zerostart-tool Co Ltd  
 DOP Precision Tool & Die  
 DTC Products Inc  
 Dubuque Stamping & Mfg Inc  
 Durable Superior Casters  
 Eagle Metals  
 Eagle Press & Equipment Co Ltd  
 EAS Mold & Die Change Systems Inc  
 Ebway LLC  
 EIGEN  
 Elizabeth Carbide Components  
 Enprotech Industrial Technologies  
 Erickson Metals Corp  
 ESI North America  
 Excelsior Hardware & Plastic Co Ltd  
 F&G Tool and Die Co  
 Fagor Arrasate  
 Falcon Tool Company  
 Feed Lease Corp  
 Fibro Inc  
 Fidelity Inspection Fixture Manufacture Co Ltd  
 FluidForming Americas  
 Fontjine Grotnes Inc  
 FORMTEK-ME  
 Fuchs Lubricants Co  
 GH Tool and Die Co Ltd  
 Gibbs  
 Goanwin USA Inc  
 Green Valley Manufacturing Inc  
 Greenerd Press & Machine Company Inc  
 Gruber Tool & Die Inc  
 Guangdong TopZone Tooling Co Ltd  
 Guangzhou Rainbow Metal Spring Co Ltd  
 Güdel  
 Helm Instrument Co Inc  
 Hilma Div Carr Lane Roemheld  
 Hitachi Metals America  
 Hong Kai Precision Metal Stamping Tool and Product Co LTD  
 Hutchison Tool Sales Co  
 IHI Ionbond Inc  
 Industrial Innovations Inc  
 IQMS  
 Jarvis Cutting Tools



**METALFORM**

JD Norman Industries  
JET-SET  
Ji' An RuiPengFei Precision Technology Co Ltd  
Jiangsu Bojun Industrial Technology Co Ltd  
JIER North America  
JIT Automation Inc  
J-Tech  
Kaeser Compressors Inc  
Komatsu America Industries LLC  
Kosmek USA  
Kunshan Eagle Precision Tooling Co Ltd  
Larson Tool & Stamping  
Latrobe Specialty Metals Distribution  
Lee Contracting Inc  
Linco Precision Industrial Co Ltd  
Linear Transfer Automation Inc  
Link Electric & Safety Control  
Logopress3/Accurate Die Design Software Inc  
LSP Industries Inc  
Lucky Harvest Co Ltd  
Macrodyne Technologies Inc  
Magnum Press Inc  
Mayfran International Inc  
Meusburger US Inc  
Midwest Industrial Metals  
MJC Engineering & Technology Inc  
Moeller Precision Tool  
Mollificio Bordignon srl  
MPP  
Multipress Inc  
Neff Press Inc  
Nidec Minster Corp  
NKS LLC  
NN Inc Precision Products Group  
NOXON Automation USA LLC  
Oneda Corporation  
Oriimec Corporation of America  
Orttech Inc  
Overton Industries  
P/A Industries Inc  
Pacesetter Systems  
Pascal Engineering Inc  
Paulo  
Pax Products Inc  
Penn United Technologies Inc  
Plex Systems  
PMF Industries Inc  
Porter Precision Products  
Pottiez America LP  
Precious Plate Inc  
Precision Metalforming Association  
Precision Punch Corp

**METALFORM**

Precision Steel Warehouse Inc  
Pressroom Electronics Inc  
PrimeTest Automation Inc  
Pronic Inc  
Qingdao Merid Machinery Co Ltd  
Quintus Technologies AB  
Ramcel Precision Stamping and Manufacturing LLC  
Raziol Zibulla & Sohn GmbH  
Ready Technology Inc  
Right Corner of Texas  
Rigidized Metals Corp  
Rock Valley Oil & Chemical Co Inc  
Rockford Systems LLC  
Rolled Metal Products  
Roller Die + Forming Co  
Ross Controls  
RUF Briquetting Systems  
Samson Roll Formed Products Co  
Sander Automation Corp  
Sangiaco Presses Americas LLC  
Sankyo Automation  
Sasahara Kanagata Co Ltd  
Scientific Forming Technologies Corp  
SelfLube  
Serapid Inc  
SEYI America Inc  
Shenzhen HuaYuanDa Technology Co Ltd  
Shenzhen Powstar Technology Ltd  
Shenzhen Yalu Industry Co LTD  
Shenzhen Zhuotai Precision Tooling  
ShopEdge Software Inc  
SIMPAC America Co Ltd  
SME  
Solar Atmospheres  
Soph Inc  
Southern Machinery Repair Inc  
Special Springs LLC  
Stamtec Inc  
Superior Die Set Corp  
TDS Automation - A Doerfer Company  
The Heim Group  
Theta TTS Inc  
Toledo Integrated Systems  
Torque Technologies Inc  
Torspec International Inc  
Tower Metalworking Fluids  
TOX Pressotechnik LLC  
Trans-Matic  
Tribco Inc  
Triple Crown Products  
T-Sim Solutions

**METALFORM**

TST Tooling Software Technology LLC  
TURCK Inc  
Uddeholm USA  
Uelner Precision Tools & Dies  
Ulbrich Stainless Steels & Special Metals Inc  
Unico Inc  
Unisorb Installation Technologies  
Unist Inc  
United Aluminum Corp  
United Machine Corp  
United Performance Metals  
Versatility Professional Tool Storage LLC  
Vibro/Dynamics LLC  
Victory Tool  
Vidir  
Voith Turbo Inc  
Wilson Tool International  
Wintriss Controls Group LLC  
WorkWise Software  
World Precise Machinery Co Ltd  
Wuxi Minghao Automotive Parts Co Ltd  
Xinyongxu Metal & Die (Shenzhen) Co Ltd  
xTuple — Open Source ERP+CRM + Web Portal  
Yih Shen Machinery Co Ltd  
Yong Da Precision Mould (Dongguan) Co Ltd  
Zapp Precision Strip  
Zerust Corrosion Solutions  
Zwick USA

**TUBE & PIPE**

5 Star Engineering and Maintenance  
Accurex Measurement Inc  
Acme Saw Plus Div Tubex Technology Machinery  
Addition Manufacturing Technologies  
Advanced Tubular Technologies Inc  
Ajax Tocco Magnethermic Corp  
Alpine Bender Machinery  
Bend Tech  
BLM Group USA Corp  
CEIA USA Induction Heating Systems  
Chang Yee Steel Co Ltd  
Chiyoda Kogyo-Maruka USA  
Clark Fixture Technologies  
Comblifit USA  
Comco USA Inc  
Cornerstone Capital Partners  
Creative Safety Supply  
Crippa SPA  
Crum Manufacturing Inc

**TUBE & PIPE**

Current Tech  
Electrex Industrial Solutions  
ESCO Tool Co  
FD Machinery  
Fenn  
FIT RITE Systems LLC  
G.B.C. Industrial Tools S.p.A.  
Gem Tool Corporation  
George A Mitchell Co  
GFU Maschinenbau GmbH  
GH Induction Atmospheres LLC  
Guid International  
Han Jie Machinery Co Ltd  
Hangzhou Wagen Precision Tooling Co Ltd  
HGG Profiling Equipment BV  
Horn Machine Tools Inc  
Huth Ben Pearson International LLC  
Industrial Solutions & Innovation LLC  
Innerspec Technologies  
Innovative Tube Equipment Corp  
INNOVO Corp  
Inserpetrol LLC  
International Tube Association  
IP Automation  
J&S Machine Inc  
Kent Corp  
Krais Tube Expanders  
Lillbacka USA  
LINSINGER  
Manchester Tool & Die Inc  
Matter Srl  
Metronor Inc  
Mii Masters  
Nantong Reliantt Trading Co Ltd  
New-Form Tools  
Numalliance Inc  
OMCG Inc  
OMNI-X USA  
Overton Industries  
Passline Performance  
PHI  
Pillar Induction  
Pines Engineering  
Proto-1 Manufacturing  
Pypeserver Inc  
Quaker Chemical Corporation  
REA JET US  
Revolution Machine Tools  
RF System Lab  
Roll Machining Technologies & Solutions  
Saar Hartmetall USA LLC  
SAET Emmedi  
Schwarze-Robitec GmbH

**TUBE & PIPE**

Shaw Stainless & Alloy  
Sonha SSP Vietnam Sole Memeber Co Ltd  
T&H Lemont  
T-Drill Industries Inc  
Tenryu America Inc  
Thermatool Corp  
Thermo Fisher Scientific  
Tools for Bending  
Transflui Maschinenbau GmbH  
TRUMPF Inc  
Tube & Pipe Technology Magazine  
Tube Bending Concepts Inc  
Tube Form Solutions  
Ultraflex Power Technologies Corp  
UniPunch Products Inc  
Unison LTD  
Universal Controls Group  
Universal Tool & Engineering  
Universal Tube Rollform Equipment Corp  
Vulcan Tool Corp  
WAFIOS Machinery Corp  
Wauseon Machine & Manufacturing Inc  
Winton Machine Company  
World Machinery & Saw Inc  
Yulcon Korea & Mexico

**WELDING**

3M  
ABB Inc  
Abicor Binzel  
Abracol North America Corp  
Accuracy Machine  
Ace Industrial Products  
Advantage Materials Inc  
AGT Robotics  
Aimchamp Abrasives  
Aimtek Inc  
Air Cleaning Specialists Inc  
Air Purification Inc  
Airgas Inc  
Alabama Laser  
Allegro Industries  
Alliance Laser Sales  
Allied Powers LLC  
ALM Positioners Inc  
ALS Maverick Testing Laboratories Inc  
Alumareel  
American Society For Nondestructive Testing  
American Technical Publishers  
American Torch Tip Co Inc

WELDING	WELDING	WELDING	WELDING	WELDING	WELDING
American Welding Society	CENIT North America Inc	eldec LLC	igm Robotic Systems Inc	MAXAIR Systems	Pandjiris Inc
American Weldquip LLC	Cerbaco Ltd	Electron Beam Technologies Inc	II-VI HIGHYAG	McDantim Inc	Parweld Ltd
AMET Inc	CGW-Camel Grinding Wheels USA	Ensitech Inc	Imperial Systems Inc	Mercer Industries	PDS Barchtech Inc
Anand Arc Ltd	Changzhou Asia Science & Technology Co Ltd	ESAB Welding & Cutting Products	International Welding Technologies Inc	Meridian Laboratory Inc	Pearl Abrasive Co
Andersen Industries Inc	Changzhou Shine Welding & Cutting Machinery Co Ltd	ESTA Extraction USA	InterTest	Metabo Corp	Pemamek LLC
ANDRITZ Soutec AG	Changzhou Huarui Welding & Cutting Machinery Co Ltd	Eurovac	Invaware Corp	Michigan Pneumatic Tool Inc	Pennsylvania College of Technology
Anhui Honyen Robot Co Ltd	Changzhou Shine Science & Technology Co Ltd	FANUC America Corp	IPG Photonics	Micro Air	PFERD INC
Anthony Welded Products Inc	Changzhou Zhengyang Welding Material Co Ltd	Fastenal Company	Ironworker Management Progressive Action Cooperative Trust	Midalloy	Phoenix International Inc
Antra Technologies Co Ltd	Chart Inc	Fein Power Tools Inc	IVEC Systems	Miller Electric Mfg Co	Plasma Automation, Inc/Vicon Machinery, LLC
Anxin Abrasives Co Ltd	Chicago Pneumatic Tool Co	Fenetech	JASIC Technologies America Inc	Millner-Haufen Tool Company	plasma USA LLC
Aquasol Corp	Cibo NV	Ferris State University	JAZ USA Inc	Mitusa Inc	Polymet Corp
Arc Products - A Lincoln Electric Co	CK Worldwide	Filter 1	Jiangsu Meixin Optoelectronics Technology Co Ltd	MK Products Inc	Praxair Inc
ARC Specialties Inc	Clamptek USA Inc	Fireball Tool	Jiangxi Guangxin New Material Co Ltd	Morris Precision Technology Company Limited	Preco Inc
Artotic	Clean Air America	Fit-up-Gear	Jinan Chpro Commercial Co Ltd	MTA-USA LLC	Preston-Eastin Inc
Astro Arc Polysoude Inc	CleanSpace Technology Pty Ltd	Flame Technologies Inc	JLC Electromet Pvt LLC	Murrplastik Systems Inc	Primax Mfg & Trading Inc/Caiman Gloves
Astrolite Alloys	Clearway	Flange Wizard Inc	John Tillman Co	NASA Technology Transfer Program	Pro Spot International
ATI Industrial Automation	Cloos Robotic Welding Inc	FlashCut CNC	Joysun Abrasives Co Ltd	Nasarc Technologies	ProArc USA
ATOP China Welding Products Co Ltd	COB Industries Inc	FlexArm Inc	JR Automation	Nation Wide Products	proAutomation LLC
Atollo Lift	Cold Jet	Flexovit USA Inc	Kalás Wire Inc	National Standard	Proceq USA Inc
Auburn Manufacturing Inc	Coldwater Machine Co	FOCUS GmbH	Kawasaki Robotics (USA) Inc	Nederman LLC	Production Products Inc
Automatic Welding Wire Company Inc	Computers Unlimited	Forney Industries Inc	Kayo Products Co Ltd	Nelson Stud Welding Inc	PROFAX / LENCO
Aviva Metals	Convergent Photonics	Fronius USA LLC	KeepTheHeat	New Fire Co Ltd	PTR-Precision Technologies Inc
AVS Industries LLC	Coral SPA	Fusion Inc	Kemper America Inc	New Spool Srl	PureFlo
AWS Bookstore	Corimpex SRL	G&J Hall Tools Inc	Kent Stud Welding Co Ltd	Newland (Tianjin) Welding Material Co Ltd	PushCorp Inc
AWS Careers in Welding Trailer	COR-MET INC	Ganzhou Hongfei Tungsten & Molybdenum Materials Co LTD	Kistler Cutting and Welding (Kistler GmbH)	Niffisk Inc	PythonX - A Lincoln Electric Co
AXXAIR USA	Cougartron Inc	GAWDA	Kobelco Welding of America Inc	Ningbo Aibo Tools Co Ltd	Qingdao Kingdom Cheer Industry Co LTD
B&B Pipe & Industrial Tool	Coxreels Inc	GE Schmidt Inc	Koike Aronson Inc	Ningbo Jamson Machinery	Radyne Corp
Baoji Taimei New Material Technology Co Ltd	CS Unitec Inc	Genesis Systems Group	KUKA Robotics Corporation	Ningbo Kimpin Industrial Pte Ltd	Rasco FR
Becken Technology Development Limited	CVI Technology	Genstar Technologies Inc	KLINGSPOR Abrasives Inc	Ningbo Nisten Enterprise Co Ltd	Ready Robotics
Beijing Essen Welding & Cutting Fair	D/F Machine Specialties Inc	Golden Eagle Minmetals (Beijing) Wldg Materials Co	Kobelco Welding of America Inc	Ningbo Powerway Alloy Material Co Ltd	Resistance Welding Machine & Accessory
Beijing Metals & Minerals Corp	Dakota Ultrasonics	Goss Inc	Koike Aronson Inc	Ningbo Starex Welding & Cutting Tech Technologies	Res-X Cut Abrasives
Bernard	Dedeco International Inc	GSM America Inc	LA-CO Industries Inc	Ningbo Zehen International Trade Co Ltd	Rhodius USA LP / Beveltools
BESSEY Tools North America	Dengensha America Corp	Gudel Inc	Laizhou Hongyuan Bench Vise Manufacture Co Ltd	Nodha Industrial Technology Wuxi Co Ltd	RIDGE
Beveler USA Inc	Diagraph MSP an ITW Company	Gulco International	Laser Mechanisms Inc	NOMMA	Rite Hite Machine Guarding
Black Stallion	Diamond Ground Products Inc	Hangzhou Xcan Saw Co Ltd	Laserline Inc	Norton   Saint-Gobain	Robotic Automation
Bluco Corp	Dino-Lite Scopes (BigC)	Hankook Weldtek Co Ltd	LeTourneau University	Novarc Technologies Inc	Robotmaster
Blue Demon Welding Products	Dinse Inc	Harbert's Products Inc/ Allied Flux Reclaiming Ltd	Lianyungang Orientcraft Abrasives Co Ltd	NSRW	RoboVent
Bollhoff USA	Direct Wire & Cable	Hardface Technologies by Postle	Liburdi Automation Inc	Octopuz Inc	RoMan Manufacturing Inc
Bonal Technologies Inc	Diversitech	Harris Products Group	LinAn Da Yang Welding Material Co Ltd	Olympus	RPB Safety LLC
Bradford Derustit Corp	Drahtwerk Elisental GmbH & Co	Hascor USA Inc	Lincoln Electric Co	Opret Inc	RWMA - Resistance Welding Manufacturing Alliance
Bruker Corporation	DualDraw LLC	HBS Stud Welding Partners	Luvata Ohio Inc	Orbitalum	Saf-T-Cart Inc
Buffalo Shrink Wrap	Dynatorch Inc	Henan Huamao Metal Materials Co Ltd	Magnatech LLC	Osborn	SanRex Corporation
BUG-O Systems	Easom Automation - A Lincoln Electric Co	Heron Intelligent Equipment Co Ltd	Magnum Reels	OTC DAIHEN Inc	Scrape-N-Burr
Burny	EASYKleen Pty Ltd.	Hobart Brothers	Magswitch Technology Inc	Otto Arc Systems Inc	Seedorff Acme Corp
Cambridge Vacuum Engineering	Edge Welding Supply	Hobart Institute of Welding Technology	Manufacturing Solutions Industries Inc	Oxylance Inc	Seit Elettronica
Capital Machine Technologies Inc	EH Wachs/Orbitalum	Huber Supply	Matsumoto US Technologies Inc	Pador Marketing Group	Select Arc Inc
Capital Weld Cleaners Carr Lane Manufacturing Co	Eidos Ergonomics	Huys Industries Ltd	Matuschek Welding Products Inc	Panasonic Factory Solutions Company of America	Servo-Robot Inc
CEI Welding Software	Ekide SL	Hypertherm Inc			Shandong Aotai Electric Co Ltd
	Elcometer Inc	IAP Air Products			Shandong Juli Welding Co LTD
		Ideal Welding Systems LP			Shanghai Binic Industrial Co Ltd

WELDING	WELDING	WELDING	WELDING	WELDING
Shanghai TAYOR Heavy Industry (Group) Co Ltd	SuperFlash Compressed Gas Equipment	TRU-FIT Products TRU-Weld	Weiler Corporation	Wuhan Welhel Photoelectric Co Ltd
Shenzhen Action Welding Technology Co Ltd	SureWerx	Trystar Inc	Weld Engineering Co	Wuxi Datang Welding & Cutting Mechanical Equipment Co Ltd
Shenzhen Donrun Welding Equipment Co Ltd	Surface Engineering Alloy Co	TURCK Inc	Weld Pride USA For Weldbrush	Wuxi Kenke Heavy Industry Equipment Co Ltd
Sideros Engineering Srl	T. J. Snow Company	TWI North America LLC	Weld Systems Integrators Inc	Wuxi Welcut Technology Co Ltd
Simufact Engineering	Taizhou Shanda Mechanical & Electrical Technology Co Ltd	Tyrolit Industrial Abrasives	Weld-Aid Products	Wuxi Yincheng Science & Technology Co Ltd
SMA Abrasives USA LLC	Taylor-Winfield Technologies Inc	UltraTech International Inc	Weldas Co LLC	Wuzhou Ally Protect Co Ltd
SMC Corporation of America	Team Industries Inc	U-Mark Inc	WeldComputer	Xiamen Honglu Tungsten Molybdenum Industry Co Ltd
Southern Copper & Supply	Taylor-Winfield Technologies Inc	Uneeda Enterprises Inc	Weldcote Metals	Xiris Automation Inc
Southern Stud Weld Inc	TEC Welding Products	United Abrasives Inc /SAIT	Welder Training & Testing Institute	Yaskawa America Inc
SPECTRO Analytical Instruments	Techflex Inc	Universal Robots USA Inc	Weldrobot Technologies Inc	Yongkang Honcho Precision Machinery Parts Co Ltd
Stahle Cybernetic Technology	Techniweld USA	Uniweld Products Inc	Weldsale LLC	York Portable Machine Tools
Standard Resistance Welder Co	TECMEN Electronics Co Ltd	Upstate SC Alliance	Welker Engineered Products	Zhejiang Changzheng Project Carbon Electrodes Co Ltd
Stanley Black & Decker Inc	Tempest Air	Uweld Technologies Co Ltd	Wendt USA LLC	Zhejiang Jingwei Welding & Cutting Technology Co Ltd
Steel Vision Tools	Tennessee Rand Inc - A Lincoln Electric Co	VDM Metals USA LLC	Wenzhou Xidin Electronics Technology Co Ltd	Zhejiang Poney Electric Co Ltd
Steelex Tools	Tersura Abrasives Co Ltd	VERNON Tool - A Lincoln Electric Co	West Chester Protective Gear	ZJ Industries Inc
Steiner Industries	The Plastic Forming Co	Victory Plasma Systems	Western Enterprises	
Strong Hand Tools	THE ROUCHE CO LLC	Viega	Wire Wizard Welding Products (elco Enterprises)	
Strong Hold Products	Thermacut Inc	Vitronic Machine Vision	WireCrafters	
STUAA Automation (Qingdao) Co Ltd	Tip Tig USA LLC	Vizient Manufacturing Solutions Inc - A Lincoln Electric Co	Wisconsin Wire Works Inc	
Suhner Industrial Products Inc	Top Cat Air Tools	VSM Abrasives Corp	WITT Gas Controls	
Sumig USA Corp	Toppas Equipment Company	Walter Surface Technologies	Wolf Robotics LLC - A Lincoln Electric Co	
Sumner Manufacturing Co	Torchmate - A Lincoln Electric Co	Washington Alloy Co	Worldwel Co Ltd	
Sunstone Welders	Trafimet Group S.p.a.	Watts Specialties Inc	Wuhan Temo Welding Consumables Co Ltd	
	Tregaskiss	Wayne Trail - A Lincoln Electric Co		
	Trendex Information Systems Inc	Weifang Forward Welding Materials Co Ltd		
	Tri Tool Inc			

## FABTECH BLUES, BREWS & BBQ

This unique meeting area located outside between Building B & C, is the perfect place to take a break and make new connections.

Open during show days from 11:00 AM until show close.

Sponsored by: **RoboVent**



SPECIAL EVENTS ARE FREE AND OPEN TO ALL ATTENDEES UNLESS OTHERWISE NOTED

## TUESDAY, NOVEMBER 6

### KEYNOTE PRESENTATION

8:45 AM - 10:00 AM

### FABx TECH TALKS



Embracing the wildly popular TED-style concept, FABTECH 2018 kicks off with an exciting format for the opening keynote. The FABx Tech Talks will spotlight visionary leaders who will motivate and inspire attendees via short inspirational talks on the topics of transformation, growth, advancement and expansion for the future of manufacturing. Come hear how these leaders are driving innovation to take their businesses to the next level.

### EXPERT PANEL PRESENTATION

12:30 PM - 1:30 PM

### INNOVATE, ACCELERATE AND ADVANCE MANUFACTURING

Learn how companies are using innovation and advanced technologies to stay at the forefront of manufacturing and how they embrace disruptive technologies to remain competitive and profitable. Our panel of experts will focus on the importance of manufacturing to the economy, jobs, and new manufacturing processes to accelerate innovation for the fourth industrial evolution.

6:30 PM - 8:30 PM

### INDUSTRY NIGHT AT MERCEDES-BENZ STADIUM FEATURING LEGENDARY FOOTBALL COACH STEVE SPURRIER



Enjoy an evening of fun, food, drinks and networking during our Industry Night Party at the spectacular Mercedes-Benz Stadium. Located just steps from the Georgia World Congress Center, the Mercedes-Benz Stadium is Atlanta's newest world-class sports and entertainment complex and home to the Atlanta Falcons.

The evening will include exclusive access to the field, on-field activities, stadium tours, and a keynote and meet-and-greet with special guest and legendary football coach Steve Spurrier.

**Advance Industry Night ticket price: \$75**

Sponsored by:  **UPG**  
join now: [upg.org](http://upg.org)

## WEDNESDAY, NOVEMBER 7

---

**8:00 AM - 10:00 AM**

### WOMEN OF FABTECH BREAKFAST



Join us for a networking breakfast celebrating the importance of women in the manufacturing sector. The breakfast will feature Laura Cox Kaplan, founder and host of the popular “She Said, She Said” podcast. Laura will interview BASF’s Veronica Braker, VP, Operations Performance Materials North America. The breakfast will conclude with a tech tour on the show floor.

**Advance ticket price: \$25**

### KEYNOTE PRESENTATION

**8:30 AM - 9:30 AM**

### KYLE PETTY



#### NASCAR Icon and Philanthropist

#### *What a Ride: Life, Family, Community and the Race Track*

Kyle Petty is an auto racing icon, a champion of philanthropy and one of the most popular personalities in all of sports. During this presentation, Petty takes audiences on an anecdotal journey through his life as a businessman, philanthropist and as one of NASCAR’s most respected drivers. He explores consistently striving for excellence, living up to your promises, teamwork, community and commitment to family.

### EXPERT PANEL PRESENTATION

**12:30 PM - 1:30 PM**

### STATE OF THE INDUSTRY

The manufacturing industry is in a constant state of transformation and manufacturing businesses are managing frequent changes in customer needs, handling competitor changing landscapes, and focusing on profit margins and revenue growth. Hear our experts discuss the issues impacting manufacturing including steel and commodity prices in general, chronic labor shortages and global trade.

## THURSDAY, NOVEMBER 8

---

**6:30 AM - 8:30 AM**

### RUN4MFG 5K



Join FABTECH at the 5th RUN4MFG 5K and show your support for the future of manufacturing! Run or walk this 3.1 mile course route through Centennial Olympic Park across from the Georgia World Congress Center. It’s a great way to meet up with FABTECH attendees and exhibitors while supporting a worthy cause.

**Advance Cost: \$35.00 (includes a RUN4MFG T-shirt)**

**THURSDAY, NOVEMBER 8****KEYNOTE PRESENTATION****8:30 AM - 9:30 AM****JONAH & DAVID STILLMAN****Best Selling Authors and Generation Experts*****Make Way for Gen Z!***

A new generation is starting to hit our workplace, yet no one is talking about it...until now! Who are Generation Z? What has shaped them? What are their expectations around careers and the workplace? What's it going to take to get this generation in the door, on board, and up to speed? Generation expert David Stillman teams up with his Generation Z son Jonah for this fresh and innovative presentation that will shed light on what makes this newest generation tick.

**EXPERT PANEL PRESENTATION****10:30 AM - 11:30 AM****MANUFACTURING AND THE NEW GENERATION WORKFORCE**

It's a fact: Millennials will make up the majority of the workforce in coming years. This lively discussion will bring together a panel of experts who will share a new perspective and help your company understand how to adapt and attract this new generation of employees. Topics covered include best practices in such areas as creating a culture of care, communication, technology, teamwork, and mentoring.

**Moderator:**

**Jonah Stillman**  
*Gen Z Ambassador  
and Best Selling  
Author*

**Panelists:**

**David Stillman**  
*Generations Expert  
and Best Selling  
Author*

**Jacob Wilson**  
*CEO, Morrison  
Industries*

**Lee Ann (Schwope) Cochran**  
*VP Sales & Marketing,  
PRADCO*

**TUESDAY, NOVEMBER 6 - THURSDAY, NOVEMBER 8****KNOWLEDGE BAR: ASK THE EXPERTS**

The Knowledge Bar, held on the show floor in the 3D/Additive Manufacturing Pavilion, will hold small group sessions that are designed to provide the opportunity to ask questions about your specific 3D/additive manufacturing challenges and get "the scoop" from industry experts. These sessions are presentation-free and all about engaging with knowledgeable people, working through challenges and meeting your specific information needs.

**SMART MANUFACTURING HUB**

Visit this dynamic area located in the A/B Connector that showcases the industry's most advanced smart technologies. The Smart Manufacturing Hub will feature several advanced manufacturing technologies, including automation, advanced materials, 3D printing, the Industrial Internet of Things (IIoT), 3D scanning, and more. Technical presentations from industry-leading smart technology providers will provide insight on recent developments in this rapidly evolving field.

Sponsored by:



InfoSight Corporation  
Chillicothe, Ohio 45601  
+1-740-642-3600  
www.infosight.com  
sales@infosight.com



BOOTH B9629  
**FABTECH**

Identification  
and Traceability  
Solutions for  
Galvanizers and Fabricators

**InfoSight**  
Corporation  
"We BARCODE Difficult Stuff"<sup>TM</sup>

# ONE MACHINE DOES IT ALL

Plasma Cutting & Drilling  
Machine now featuring  
Automated Part Removal

FABTECH 2018 Atlanta, GA  
Booth # B8467



**Kinetic**

[www.KineticUSA.com](http://www.KineticUSA.com)  
1.800.606.2954



## ABOUT THE EDUCATION PROGRAM

The Fabricators & Manufacturers Association, Int'l (FMA), SME, Precision Metalforming Association (PMA), and Chemical Coaters Association International (CCAI) cosponsor the sessions on 3D/additive manufacturing, automation, cutting/laser, finishing, forming & fabricating, lean, management, marketing & sales tools, smart manufacturing, stamping, welding fabrication, and workforce development. All sessions are two hours in length, offering practical knowledge you can use right away. Sessions with Tech Tours combine classroom instruction and expert-led guided tours on the show floor to see technology operating in designated booths.

The American Welding Society (AWS) presents a comprehensive lineup of welding education. Led by the industry's top professionals, programs focus on best practices and new commercial developments in welding. Events include career path workshops, seminars, RWMA Resistance Welding School, professional program, society events, and more.

### EXPERIENCE LEVELS

The Schedule-at-a-Glance on the following pages provides a quick reference to all the educational sessions offered at FABTECH 2018. Use the following key to find the education level that meets your needs.

- B Basic** – Recommended for the attendee who is new to the industry or needs a refresher on the topic.
- I Intermediate** – Designed for the attendee who already has a basic understanding of the subject matter.
- A Advanced** – For the attendee with several years of experience who is seeking more in-depth information.

### CONTINUING EDUCATION CREDITS

Individuals who attend AWS Education programs are awarded 1 PDH (Professional Development Hour) for each hour of education program attendance. Individuals seeking FMA Recertification Credits will be awarded 2 credits for each conference session attended (forming & fabricating, cutting, or finishing tracks) plus an additional 2 credits for attending the show. Individuals who attend SME education sessions may be eligible to receive 1 credit per hour attended toward their SME-managed recertification requirements.

### MEMBERSHIP INFORMATION

Discounted rates for members are available on educational sessions. Interested in becoming a member of AWS, FMA, SME, PMA or CCAI? Find details on each of the cosponsor associations and membership benefits by visiting their websites today!





TECHNOLOGY	8:00 AM – 10:00 AM	10:30 AM – 12:30 PM	1:30 PM – 3:30 PM
3D/ADDITIVE MANUFACTURING	<b>NEW! F10:</b> Revolutionizing 3D Additive Manufacturing <b>I</b>	<b>NEW! F20:</b> Introduction to Additive Manufacturing and 3D Printing <b>B</b>	<b>F30:</b> Fundamentals of 3D Additive Scanning and Imaging <b>I</b>
AUTOMATION	<b>NEW! F11:</b> Robotics and Automated Systems for Joining and Laser Industry 4.0 <b>I</b>	<b>F21:</b> Getting Started with Robotics <b>B</b>	<b>NEW! F31:</b> Automation Software for Fabrication Business <b>I</b>
CUTTING/LASER		<b>NEW! F22:</b> Advanced Fiber Laser Applications & Developments <b>I</b>	<b>F32:</b> Comparative Cutting Systems with Tech Tour <b>B</b>
FINISHING		<b>C20:</b> Building Blocks of Powder Coating <b>B</b>	<b>C30:</b> The ABCs of Infrared <b>B</b>
		<b>C21:</b> Fundamentals of a Successful E-Coat Operation <b>B</b>	<b>NEW! C31:</b> First Things First - Hanging and Masking <b>I</b>
		<b>C22:</b> Pretreatment Challenges <b>I</b>	<b>C32:</b> New or Improve - What's Best for Your System <b>I</b>
FORMING & FABRICATING	<b>F13:</b> Coil Processing: Advancements in Slitting, Leveling and Storage <b>I</b>	<b>NEW! F23:</b> Press Brake Springback Solutions <b>I</b>	<b>F33:</b> Press Brake Safety: ANSI B11.3 Explained <b>I</b>
	<b>F14:</b> Roll Forming: In-Line Punching, Cutoff Dies and Press Tonnage <b>I</b>	<b>F24:</b> Welding Advancements for Tube & Pipe <b>I</b>	<b>F34:</b> Tube & Pipe: Bending <b>I</b>
LEAN	<b>NEW! F15:</b> Lean Principle: Strategic Planning and Organizational Alignment <b>A</b>	<b>NEW! F25:</b> Lean Principle: Developing Your People <b>I</b>	<b>F35:</b> Lean Tools: Value Stream Mapping, Addressing Differences Between Office and Shop Floor <b>I</b>
MANAGEMENT	<b>F16:</b> Fundamentals of Activity-Based Costing & Estimating <b>I</b>	<b>NEW! F26:</b> Rising Above It All: The Art and Science of Organizational Transformation <b>I</b>	<b>NEW! F36:</b> Becoming a Learning Leader and Avoiding the Fatal Flaws of Failure Part I and Part II <b>I</b>
MARKETING & SALES TOOLS		<b>NEW! F27:</b> Increase Your ROI with Digital Marketing for Manufacturers <b>I</b>	<b>NEW! F37:</b> Marketing Boot-camp: Technology, Prospects & Voice of the Customer <b>B</b>
SMART MANUFACTURING		<b>NEW! F28:</b> Roadmap to Smart Manufacturing Transformation <b>I</b>	<b>NEW! F38:</b> Smart Manufacturing Technology & Workforce Ready <b>B</b>
STAMPING		<b>S20:</b> Machine Safety - Safeguarding Overview <b>I</b>	<b>NEW! S30:</b> Machine Safety - Alternative Methods for Applying Hazardous Energy Control <b>I</b>
		<b>S21:</b> Lubrication Technology <b>I</b>	<b>NEW! S31:</b> Sensor Technology - Eliminating Die Crashes <b>I</b>
WELDING FABRICATION		<b>NEW! W20:</b> Welding for Steel and Aluminum Applications <b>I</b>	<b>NEW! W30:</b> Welding for Laser & Cutting Repair Technology <b>I</b>
WORKFORCE DEVELOPMENT	<b>NEW! F19:</b> 8 Elements to Effective Delegation & How to Get More from the People You've Got <b>B</b>	<b>NEW! F29:</b> Innovative Techniques to Manage Significant Improvement and Change Initiatives <b>I</b>	<b>NEW! F39:</b> The Beauty of Being Lost: Make Better Decisions & Lead Change In Your Organization <b>I</b>
<b>WELDING</b>			
SEMINARS	<b>W10:</b> NDT Day ..... 8:00 AM – 5:00 PM		
	<b>W13:</b> CWI Part B Hands On Experience - Day 1 ..... 8:00 AM – 5:00 PM		
	<b>W14:</b> Welding of Stainless Steel - Day 1 ..... 8:00 AM – 5:00 PM		
CAREER PATH WORKSHOPS	<b>W16:</b> Starting a Welding Inspection Business ..... 10:00 AM – 12:00 PM		
	<b>W17:</b> Creating a WPS in 60 Seconds ..... 1:00 PM – 3:00 PM		
	<b>W18:</b> Welding Engineers Round Table Discussion ..... 3:00 PM – 5:00 PM		
PROFESSIONAL PROGRAM	<b>W23: Session 1:</b> Additive Manufacturing ..... 8:00 AM – 12:00 PM		
	<b>Session 2:</b> Modeling and Numerical Analysis I ..... 8:00 AM – 12:00 PM		
	<b>Session 3:</b> Welding Metallurgy ..... 8:00 AM – 12:00 PM		
	<b>Session 4:</b> Sensing and Control of Welding Processes ..... 2:00 PM – 5:00 PM		
	<b>Session 5:</b> Solid-State Processes ..... 2:00 PM – 5:00 PM		
	<b>Session 6:</b> Weldability Studies ..... 2:00 PM – 5:00 PM		
EDUCATIONAL SESSIONS	<b>W28:</b> National Center for Welding Education and Training, Weld-Ed ..... 10:00 AM – 3:00 PM		
RWMA SCHOOL	<b>W22:</b> RWMA Resistance Welding School - Day 1 ..... 8:00 AM – 4:15 PM		

TECHNOLOGY	8:00 AM – 10:00 AM	10:30 AM – 12:30 PM	1:30 PM – 3:30 PM
3/D ADDITIVE MANUFACTURING	<b>NEW! F40:</b> A Guideline to Metal AM - Processes, Design and Applications <b>I</b>	<b>F50:</b> Business Considerations for 3D Additive Technology with Tech Tour <b>B</b>	<b>NEW! F60:</b> 3D Additive Manufacturing Applications for Fabricators <b>I</b>
AUTOMATION	<b>NEW! F41:</b> Integrated Solutions for Industrial Automation <b>I</b>	<b>NEW! F51:</b> 10 Signs Your Business Needs to Replace Its ERP & Leveraging Next Gen Cloud ERP <b>B</b>	<b>NEW! F61:</b> Automated Technology Application and Benefits for Laser and Joining Process <b>I</b>
CUTTING / LASER	<b>AWF100:</b> Laser Welding for Today's Fabricator Workshop <b>I</b>		<b>NEW! F62:</b> Next-Generation Laser Cutting Technology and Future Oxy-Fuel Cutting <b>I</b>
FINISHING	<b>C40:</b> Optimizing Batch Powder Coating Operations <b>I</b>	<b>NEW! C50:</b> Powder Coating and Industry 4.0, Really? <b>A</b>	<b>NEW! C60:</b> Automation - Is It for Everyone? <b>I</b>
	<b>NEW! C41:</b> Blasting Your Way to Success <b>I</b>	<b>C51:</b> Identify and Solve Finishing Defects: See It, Touch It, Fix It <b>I</b>	<b>NEW! C61:</b> Safety - It Works for All of Us <b>I</b>
	<b>C42:</b> Architectural Coatings - Building a Lasting Finish <b>I</b>	<b>NEW! C52:</b> Developing a Liquid Coating Knowledge Base <b>B</b>	<b>NEW! C62:</b> Improving Performance of Pretreatment Processes <b>I</b>
FORMING & FABRICATING	<b>NEW! F43:</b> Sheet Metal: Controlling Costs with Good Design and Equipment Purchases <b>I</b>	<b>F53:</b> Roll Forming: Justification, Basics and Lubricants <b>B</b>	<b>F63:</b> Tube & Pipe: Forming and Lubrication <b>A</b>
	<b>NEW! F44:</b> Coil Processing: Slitting Thin Materials and Laser Blanking <b>I</b>	<b>F54:</b> Effective Safeguarding Risk Assessment <b>B</b>	<b>NEW! F64:</b> Hot Forming with Titanium <b>I</b>
LEAN	<b>F45:</b> Lean Tools: A3 Thinking-Developing People & Solving Problems <b>I</b>	<b>F55:</b> Lean Tools: Flow and Pull Creating Flow in High-Variety Environments <b>I</b>	<b>F65:</b> Lean Principle: Continuous Improvement in Lean Culture <b>B</b>
MANAGEMENT	<b>NEW! F46:</b> Innovation & Business Strategies for Growth! <b>I</b>	<b>NEW! F56:</b> What's Your Business Worth & Patent Rights for Your IP <b>I</b>	<b>F66:</b> Succession Strategies to Protect Your Business! <b>B</b>
MARKETING & SALES TOOLS	<b>NEW! F47:</b> 5 Steps to World-Class Customer Experiences <b>B</b>	<b>NEW! F57:</b> Sales & Marketing Performance Management of People and Systems <b>I</b>	<b>NEW! F67:</b> Actionable Marketing Strategies for Competitive Advantage <b>I</b>
SMART MANUFACTURING	<b>NEW! F48:</b> The Human and Digital Role in The Factory of the Future <b>I</b>		<b>NEW! F68:</b> Actionable Intelligence: Manage Data to Enable Good Decisions <b>A</b>
STAMPING	<b>S40:</b> Sensor Technology - Practical Applications <b>I</b>	<b>S50:</b> Advance Press Room Technology <b>I</b>	<b>NEW! S60:</b> Sensors, Controls and Connectivity <b>I</b>
	<b>S41:</b> Stamping AHSS Materials <b>I</b>	<b>NEW! S51:</b> Solving Progressive Die Problems <b>I</b>	<b>S61:</b> Preventative Maintenance in the Press Room <b>I</b>
WELDING FABRICATION	<b>NEW! W40:</b> Welding of Advanced Specialty Materials <b>I</b>	<b>NEW! W50:</b> Lean & Quality Welding for Smart Manufacturing <b>I</b>	<b>NEW! W60:</b> Fundamentals of Welding Project Success <b>I</b>
WORKFORCE DEVELOPMENT	<b>F49:</b> Manufacturing and the Millennial: How to Attract and Retain Emerging Leaders <b>B</b>	<b>NEW! F59:</b> Accountability, Engagement & A Culture that Rocks <b>I</b>	<b>F69:</b> Accelerating Workforce Performance Through Best Practices in Learning & Development <b>I</b>
<b>WELDING</b>			
SEMINARS	<b>W11:</b> The Why and How of Welding Procedure Specifications ..... 8:00 AM – 5:00 PM		
	<b>W13:</b> CWI Part B Hands-On Experience - Day 2 ..... 8:00 AM – 5:00 PM		
	<b>W14:</b> Welding of Stainless Steel - Day 2 ..... 8:00 AM – 5:00 PM		
CAREER PATH WORKSHOPS	<b>W19:</b> Getting Started in Underwater Welding ..... 9:00 AM – 11:00 AM		
	<b>W21:</b> Opportunities in Welding ..... 1:00 PM – 2:30 PM		
PROFESSIONAL PROGRAM	<b>W24: Session 7:</b> Plenary Session..... 8:00 AM – 9:30 AM		
	<b>Session 8:</b> High Energy Density Processes..... 9:30 AM – 12:00 PM		
	<b>Session 9:</b> Honorary Symposium for Dr. John Elmer - Contributions to the Welding Metallurgy of Stainless Steels... 9:30 AM – 12:00 PM		
	<b>Session 10:</b> Arc Welding..... 9:30 AM – 12:00 PM		
	<b>Session 11:</b> Applied Technology..... 1:00 PM – 5:00 PM		
	<b>Session 12:</b> Honorary Symposium for Dr. John Elmer - Contributions to Advanced In-Situ Characterization..... 2:00 PM – 5:00 PM		
	<b>Session 13:</b> Modeling and Numerical Analysis II..... 1:00 PM – 5:00 PM		
EDUCATIONAL SESSIONS	<b>W28:</b> National Center for Welding Education and Training, Weld-Ed..... 8:00 AM – 12:00 PM		
RWMA SCHOOL	<b>W22:</b> RWMA Resistance Welding School - Day 2..... 8:00 AM – 4:15 AM		

TECHNOLOGY	8:00 AM – 10:00 AM	10:30 AM – 12:30 PM	1:30 PM – 3:30 PM
3/D ADDITIVE MANUFACTURING	<b>NEW! F70:</b> Additive Manufacturing and Hybridized Production & Workflows <b>I</b>	<b>NEW! F80:</b> 3D Additive Manufacturing Tools for Fabricators <b>I</b>	
AUTOMATION	<b>NEW! F71:</b> Profitable Benefits of Automation in the Job Shop <b>B</b>	<b>NEW! F81:</b> Automation Monitoring & Maintaining Your Machines <b>I</b>	<b>NEW! F91:</b> Embracing Variability for Better Performance In Planning and Execution <b>A</b>
CUTTING / LASER	<b>NEW! F72:</b> Cutting Materials, Technology & Software - Nothing Has Changed...Except Everything! <b>B</b>	<b>NEW! F82:</b> Technologies for Waterjet & Plasma Advancements & Applications <b>I</b>	
FINISHING	<b>NEW! C70:</b> Top 10 Tips for Maintaining Your Powder Coating Operation <b>I</b>	<b>NEW! C80:</b> Key Elements of Spray Booth Design <b>I</b>	
	<b>NEW! C71:</b> From E-Coat to Top Coat <b>A</b>	<b>C81:</b> All About Ovens <b>I</b>	
	<b>NEW! C72:</b> Advancements in Pretreatment <b>I</b>		
FORMING & FABRICATING	<b>NEW! F73:</b> Alternate Forming Processes <b>I</b>	<b>F83:</b> Advanced Press Brake Technologies <b>I</b>	
	<b>F74:</b> Roll Forming: Tooling Design and Advanced Techniques <b>I</b>	<b>NEW! F84:</b> Tube & Pipe Cutting <b>I</b>	
LEAN	<b>NEW! F75:</b> Lean Tools: Advanced Lean Design and Preventative (PM) and Predictive Maintenance Strategies <b>I</b>	<b>F85:</b> Lean Tools: Lean Journey Case Studies and Lesson Learned <b>B</b>	
MANAGEMENT	<b>NEW! F76:</b> Managing Innovation in 21 <sup>st</sup> Century Business <b>I</b>	<b>NEW! F86:</b> Leadership Development for Millennials <b>B</b>	<b>NEW! F96:</b> Tax Reform, Tax Credits & Bringing Manufacturing Back to America <b>B</b>
MARKETING & SALES TOOLS			
SMART MANUFACTURING	<b>NEW! F78:</b> Smart Manufacturing Supply Chain & Real-World Case Studies <b>I</b>	<b>NEW! F88:</b> Smart Manufacturing Product Development Process: Get to Market Faster <b>B</b>	
STAMPING	<b>NEW! S70:</b> Sheet Metal Properties, Deformation Modes and Simulation Experiments <b>I</b>	<b>NEW! S80:</b> Stamping Process Optimization <b>I</b>	
	<b>S71:</b> Transfer System Technology <b>I</b>	<b>NEW! S81:</b> Apprenticeship Program for Pressroom Technicians <b>I</b>	
WELDING FABRICATION			
WORKFORCE DEVELOPMENT	<b>NEW! F79:</b> Career-Pathing and Building Advanced Manufacturing Pipelines <b>B</b>	<b>NEW! F89:</b> Engaging, Retaining & Filling Open Positions; Do More with Less <b>B</b>	<b>NEW! F99:</b> Leverage Culture to Communicate & Deliver Breakthrough Results <b>I</b>
<b>WELDING</b>			
SEMINARS	<b>W12:</b> Metallurgy Applied to Everyday Welding ..... 8:00 AM – 4:15 PM <b>W15:</b> Better Understanding of Welding Symbols ..... 8:30 AM – 12:30 PM		
PROFESSIONAL PROGRAM	<b>W25: Session 14:</b> Welding Metallurgy and Weldability Studies..... 8:00 AM – 10:30 AM <b>Session 15:</b> Honorary Symposium for Dr. John Elmer - Contributions to High Energy Density Welding..... 8:00 AM – 11:00 AM <b>Session 16:</b> Cladding and Dissimilar Joining..... 8:00 AM – 10:30 AM		

**EXPERIENCE LEVELS**

Use this key along with the Schedule-at-a-Glance to find the education level that meets your needs.

- B Basic** - Recommended for the attendee who is new to the industry or needs a refresher on the topic.
- I Intermediate** - Designed for the attendee who already has a basic understanding of the subject matter.
- A Advanced** - For the attendee with several years of experience who is seeking more in-depth information.

# PRICING INFORMATION

## EXHIBITS ONLY

**Registration is FREE through November 2.** Beginning November 3, the cost to attend the exhibits is \$50. AWS, FMA, SME, PMA, and CCAI members may always attend the exhibits for FREE with proof of membership.

## SPECIAL EVENTS

### INDUSTRY NIGHT AT MERCEDES-BENZ STADIUM

**TUESDAY, NOVEMBER 6**

Advance ticket price for attendees is \$75 and includes food and drinks, networking, entertainment, and more at Atlanta's Mercedes-Benz Stadium.

### WOMEN OF FABTECH BREAKFAST WITH TECH TOUR

**WEDNESDAY, NOVEMBER 7**

Price for FABTECH Attendees is \$25 and includes a continental breakfast.

### RUN4MFG 5K

**THURSDAY, NOVEMBER 8**

Registration for FABTECH Attendees is \$35\* and includes a FABTECH 2018 RUN4MFG T-shirt. (\*After Nov. 3 registration increases to \$50.)

## EDUCATION PROGRAMS

### 3D/ADDITIVE MANUFACTURING, AUTOMATION, CUTTING/LASER, FINISHING, FORMING & FABRICATING, LEAN, MANAGEMENT, MARKETING & SALES TOOLS, SMART MANUFACTURING, STAMPING, WELDING FABRICATION, WORKFORCE DEVELOPMENT TRACKS

Packages (Buy More and SAVE!)	Member	Non-member
1 Session	\$175	\$200
2 Sessions	\$300	\$350
3 Sessions	\$405	\$480
4 Sessions	\$500	\$600
5 Sessions	\$600	\$725
<b>Full Conference:</b> (6 or more sessions)	\$690	\$840

**NOTE:** The rate for the 1/2-Day Laser Welding for Today's Fabricator Workshop (Session AWF100) is \$335 for Members and \$420 for Non-members.

## WELDING TRACK

	Member	Non-member <sup>a</sup>
2-Day AWS Educational Sessions	\$150	\$225
1/2-Day Seminar	\$375	\$425
1-Day Seminar	\$565	\$665
2-Day Seminar or RWMA School	\$795	\$895
Career Path Workshops	\$50	\$75
1-Day Professional Program	\$175	\$225
3-Day Professional Program	\$375	\$425
Student Professional Program	\$75	\$100 <sup>b</sup>
AWS Awards Luncheon	\$30	\$35
AWS Prayer Breakfast	\$10	\$10

<sup>a</sup> Non-member price for AWS Sessions only includes a one-year AWS Individual Membership.

<sup>b</sup> Non-member Student Professional Program price includes a one-year AWS Student Membership.

**CONFERENCE CANCELLATION POLICY:** Cancellations must be made in writing and faxed to Attn: FABTECH Conference Cancellation at (313) 425-3407 no later than November 3, 2018 to receive a full refund minus a \$50 administrative fee. Cancellations received after this date are nonrefundable. Substitutions allowed.

## 3D/ADDITIVE MANUFACTURING

## TUESDAY, NOVEMBER 6

8:00 AM – 10:00 AM

**NEW! F10: REVOLUTIONIZING 3D ADDITIVE MANUFACTURING** 

3D Printing &amp; The Next Industrial Revolution

Greg Mark - Markforged

**Choosing Between Additive and Subtractive Manufacturing**

Greg Paulsen - Xometry

**How Composites Are Revolutionizing The Manufacturing Line**

Jonathon Reilly - Markforged

10:30 AM – 12:30 PM

**NEW! F20: INTRODUCTION TO ADDITIVE MANUFACTURING AND 3D PRINTING** 

Rick Neff - Cincinnati Inc.

1:30 PM – 3:30 PM

**F30: FUNDAMENTALS OF 3D ADDITIVE SCANNING AND IMAGING** 

Carl Dekker - Met-L-Flo Inc.

## WEDNESDAY, NOVEMBER 7

8:00 AM – 10:00 AM

**NEW! F40: A GUIDELINE TO METAL AM - PROCESSES, DESIGN AND APPLICATIONS** 

Frank Geyer and Franziska Maschowski - TRUMPF Inc.

10:30 AM – 12:30 PM

**F50: BUSINESS CONSIDERATIONS FOR 3D ADDITIVE TECHNOLOGY WITH TECH TOUR** 

Carl Dekker - Met-L-Flo Inc.

1:30 PM – 3:30 PM

**NEW! F60: 3D ADDITIVE MANUFACTURING APPLICATIONS FOR FABRICATORS** 

A Deep Dive into Metal 3D Printing

Eric Utley - Proto Labs

**Tried and True or Something New: Investment Casting versus Metal 3D Printing**

Eric Mutchler - Stratasys Direct Manufacturing

**Manual Laser Deposition As A Repair Process for 3D Printed Parts**

Christopher Learn - Phoenix Laser Solutions and Wesley Wheeler - Alpha Laser-US

**Achieving Theoretical Packing Density in Additive Manufacturing**

Juan Schneider - Nanogrande Inc.

## THURSDAY, NOVEMBER 8

8:00 AM – 10:00 AM

**NEW! F70: ADDITIVE MANUFACTURING AND HYBRIDIZED PRODUCTION & WORKFLOWS** 

The Role of Hybrid Manufacturing in 3D-Printing - Attributes and Future Avenues

Yashwanth Kumar Bandari and Alex Roschli - Oak Ridge National Laboratory

**Additive Manufacturing Workflows - Hybrid Production of Metal and Silicone Parts**

Jennifer Milne - Formlabs

**Hybridized Manufacturing - Enhancing Traditional Tools with Additive Manufacturing**

Kaitlyn Bailey and Cody Culbertson - FATHOM

10:30 AM – 12:30 PM

**NEW! F80: 3D ADDITIVE MANUFACTURING TOOLS FOR FABRICATORS** 

3D Post-Printing and the Advancement of the Direct Digital Thread

Daniel Hutchinson - PostProcess Technologies Inc.

**Is 3D Printing the Right Process for Your Metal Part? It Depends.**

Eric Utley - Proto Labs

**The 'Supply Chain' is About to Break. How 3D Printing is Ushering in the Supply Web**

Cullen Hilkene - 3Diligent

## AUTOMATION

## TUESDAY, NOVEMBER 6

8:00 AM – 10:00 AM

**NEW! F11: ROBOTICS AND AUTOMATED SYSTEMS FOR JOINING AND LASER INDUSTRY 4.0** 

Cutting and Joining Industry 4.0 Into Shape

Mike Pantaleano and Holger Hahn - ESAB Welding &amp; Cutting Products

**How Flexible and User-Friendly Collaborative Robots (Cobots) Can Automate Welding, Plasma Cutting and Other Process-Based Metal Fabricating Tasks**

Brian Dillman - Universal Robots

**Automated Laser Joining Systems That Produce Tailor Welded Blanks for Worldwide Automotive Industry: Production Systems That Meet Tomorrow's Manufacturing Challenges**

David Guastaferrri - Lincoln Electric Automation

**10:30 AM – 12:30 PM****F21: GETTING STARTED WITH ROBOTICS** **B**

Bob Rochelle - Gudel Inc.

**1:30 PM – 3:30 PM****NEW! F31: AUTOMATION SOFTWARE FOR FABRICATION BUSINESS** **I****Get Ready for Growth: Purpose-Built Fabrication Business Technology**

Christine Hansen - Epicor Software Corp.

**Abandoned Implementation: The Real "AI" Challenging Manufacturers**

Jean Magny - Genius ERP

**Future of Manufacturing with Pragmatic Generative Technology**

Mike Spellman, Phillip Doup and Sachlene Singh - Autodesk

**WEDNESDAY, NOVEMBER 7****8:00 AM – 10:00 AM****NEW! F41: INTEGRATED SOLUTIONS FOR INDUSTRIAL AUTOMATION** **I****How IO-Link is Revolutionizing Industrial Automation**

Will Healy - Balluff, Inc.

**Reviewing Automatically Generated Connections**

Steve Ashton - Ashton Engineering and Detailing, LLC

**How to Adapt Parametric Modeling for Custom Fabrication**

Jody Beck - Alabama Productivity Center

**10:30 AM – 12:30 PM****NEW! F51: 10 SIGNS YOUR BUSINESS NEEDS TO REPLACE ITS ERP & LEVERAGING NEXT-GEN CLOUD ERP** **B****10 Signs Your Business Needs to Replace Its ERP**

Bridget Lazlo - Guardian Business Solutions, Inc.

**Crossing the Chasm-Leveraging Next-Gen Cloud ERP**

David Lechleitner - KeyedIn Solutions

**1:30 PM – 3:30 PM****NEW! F61: AUTOMATED TECHNOLOGY APPLICATION AND BENEFITS FOR LASER AND JOINING PROCESS** **I****The Requirement for Smart Workflows Around High-Powered Fiber Lasers**

Brendon DiVincenzo - Bystronic Inc.

**How Automated Crash Detection Can Save You and Your Customers Time and Money**

Stefan Casey - Applied Robotics, Inc.

**Benefits of Adaptive Robotics for the Metal Fabrication Industry**

Louis Dicaire - AGT Robotics

**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F71: PROFITABLE BENEFITS OF AUTOMATION IN THE JOB SHOP** **B****Benefits of Multi-Arm Robotic Systems**

Terry Tupper - Fanuc America Corporation

**Profitable Robotic Programming for Low-Volume, High-Mix Production**

Garen Cakmak - Hypertherm Robotic Software

**Real World, Augmented Reality, Augmented Virtuality, Virtual Reality... How Many Realities Can You Have In Industrial Automation?**

Simone Gianotti - Schneider Electric

**Connecting You and Your Customers**

Brad Stropes - SecturaSOFT

**10:30 AM – 12:30 PM****NEW! F81: AUTOMATION MONITORING & MAINTAINING YOUR MACHINES** **I****Saving Money by Adopting Preventative (PM) and Predictive (PdM) Maintenance Strategies**

Michael Schlagenhauser - Acuity

**Predictive Maintenance: The Break/Fix is Dead**

Will Zell - Nikola Labs

**Wireless Monitoring for Maintenance Team: How Vibration, Thermal and Electrical Online Monitoring Provide a Complete Solution**

Alex Desselle - Fluke

**1:30 PM – 3:30 PM****NEW! F91: KEEPING YOUR ENEMY CLOSER: EMBRACING VARIABILITY FOR BETTER PERFORMANCE** **I**

Michael Lilly - LillyWorks, Inc.

## CUTTING/LASER

**TUESDAY, NOVEMBER 6****10:30 AM – 12:30 PM****NEW! F22: ADVANCED FIBER LASER APPLICATIONS & DEVELOPMENTS** **I****Fiber Developments and Productivity**  
Dustin Diehl - Amada America, Inc.**Fiber Laser with Optimized Beam Characteristics for Metal Cutting**  
Dahv Kliner - nLIGHT Corp.**Joining of Copper and Aluminum with IR Fiber Lasers**  
Eric Stiles - IPG Photonics Midwest**Real Time Vision Inspection of Laser Brazing or Welding Process**  
Jason Woolley - Abicor Binzel**Advanced Applications Enabled by Next-Generation Fiber Lasers**  
Brian Victor - nLIGHT Corp.**1:30 PM – 3:30 PM****F32: COMPARATIVE CUTTING SYSTEMS WITH TECH TOUR** **B****Waterjet Cutting**  
David Dumas - Hypertherm Inc.**Laser Cutting**  
Hank White - MC Machinery Systems, Inc.**Plasma Cutting**  
Jim Colt - Hypertherm Inc.**WEDNESDAY, NOVEMBER 7****8:00 AM – 12:30 PM****AWF100: LASER WELDING FOR TODAY'S FABRICATOR WORKSHOP** **I****Essential Considerations for Laser Welding - From Component Design to Implementation**  
David Havrilla - TRUMPF Inc.**Introduction to Industrial Laser Welding**  
Tom Kugler - Laser Mechanisms, Inc.**Laser Sources for Industrial Laser Welding: Fiber, Disk and Diode**  
Jean-Philippe Lavoie - Coherent Inc.**Material Selection for Laser Welding**  
Geoff Shannon - Coherent Inc.**System Overview for Laser Welding**  
Mark Boyle - Amada Miyachi America**Hybrid Laser Welding**  
Paul Denney - IPG Photonics**Laser Welding and Additive Technologies**  
Wayne Penn - Alabama Laser**Fiber Laser Cutting and Joining: Recent Advances in Technology, Tools, and Applications**  
Robert Borgstrom - Precitec**Laser Process Monitoring - The Use of Data**  
Mark Rodighiero - Amada Miyachi America**1:30 PM – 3:30 PM****NEW! F62: NEXT GENERATION LASER CUTTING TECHNOLOGY** **I****Combination Punch/Laser Machines - The Ultimate in Sheet Metal Fabrication Technology**  
Timothy Brady - Amada America, Inc.**High-Power Diode Lasers and Innovative Industrial Applications**  
Oleg Raykis - Laserline Inc.**Oxy-Fuel Cutting - It's Time to Increase Your Profitability**  
Kurt Nachbargauer - IHT Automation GmbH & Co. KG**High-Speed Metal Cutting Using The Hybrid Induction-Plasma-Oxygen Process**  
Jerry Jones - EnergynTech, Inc.**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F72: CUTTING MATERIALS, TECHNOLOGY & SOFTWARE - NOTHING HAS CHANGED...EXCEPT EVERYTHING!** **B****Cutting Materials - Nothing has Changed... Except Everything**  
Kris Scherm - Multicam**Today's Nesting Software: Why Having Your Cutting Machines Connected to Your Network Matters**  
Derek Weston - Hypertherm Inc.**Design and Manufacturing Automation for Smart Production**  
Dylan MacLean and Ravi Javia - Autodesk Inc.**10:30 AM – 12:30 PM****NEW! F82: TECHNOLOGIES FOR WATERJET & PLASMA ADVANCEMENTS & APPLICATIONS** **I****Making a Decision: Buying Criteria vs. Ownership Criteria for High-Pressure Waterjet Equipment**  
Bart Rijken - Hypertherm Inc.**Advancements in Waterjet Technology: How Predictive Systems Streamline Productivity**  
Arion Vandergon - Hypertherm Inc.**Understanding and Optimizing High-End Plasma Cut Quality**  
Harsha Jogdand and Phillip Parker - Hypertherm Inc.**The Value of a Self-Cleaning Cutting Table for Plasma Cutting**  
Allan Holst - Park Industries

**TUESDAY, NOVEMBER 6****10:30 AM – 12:30 PM****C20: BUILDING BLOCKS OF POWDER COATING** **B**

Frank Mohar - Nordson Corp., John Sudges - Midwest Finishing Systems, Inc. and Michael Withers - Axalta Coating Systems

**C21: FUNDAMENTALS OF A SUCCESSFUL ELECTROCOATING OPERATION** **B**

Chad Andraea - Therma-Tron-X, Inc.

**C22: PRETREATMENT CHALLENGES** **I**

**From Pretreatment Issues to Finish Quality**  
Sergio Mancini - Bulk Chemicals, Inc.

**To Descale or Not to Descale...That is the Topic**

Ken Kaluzny - Coral Chemical Company

**Cyanide Destruction: A New Look at an Age-Old Problem**

Robin Deal - Hubbard-Hall

**Optimizing and Maintaining Spray Patterns in a Wash System**

Matthew Clark - Henkel

**1:30 PM – 3:30 PM****C30: THE ABCs OF INFRARED** **B**

Scott Bishop - Alabama Power Co., Baskar Vairamohan - Electric Power Research Institute (EPRI), John Podach - Fostoria Process Equipment, and Tim O'Neal - Selas Heat Technology Co.

**NEW! C31: FIRST THINGS FIRST - HANGING AND MASKING** **I****Hanging Proficiency - A Key to Production Efficiency**

Scott Rempala - Mighty Hook

**Masking Solutions**

Christopher Malone, Mike Connell and Hans Nilarp - Caplugs

**C32: NEW OR IMPROVE - WHAT'S BEST FOR YOUR FINISHING SYSTEM** **I****A Case Study Judging the Feasibility of Purchasing a New Finishing System**

Nicholas Liberto - Powder Coating Consultants

**Knowing When to Upgrade Your System**

Matt Ambrose - Nordson Corp.

**Ideas for implementing Lean into Your Powder Coating Operation**

Marty Sawyer - Trimac Industrial Systems, LLC

**WEDNESDAY, NOVEMBER 7****8:00 AM – 10:00 AM****C40: OPTIMIZING BATCH POWDER COATING OPERATIONS** **I**

John Sudges - Midwest Finishing Systems, Inc., John Cole - Parker Ionics and Suresh Patel - Chemtall US, Inc., a BASF Company

**NEW! C41: BLASTING YOUR WAY TO SUCCESS** **I****You Cannot Manage What You Do Not Measure - The Increasing Role of Technology in Measuring and Managing Your Blast Operation**

Joseph Craig - Blast Services Inc.

**Reducing the Strain with Limited Maintenance Resources to Maintain Your Shot Blasting Equipment**

Carl Panzenhagen - Blast Cleaning Technologies

**CO<sub>2</sub> Spray Cleaning and Pretreatment of Surfaces for Automotive Applications**

Nelson Sorbo - Cool Clean Technologies

**C42: ARCHITECTURAL COATINGS - BUILDING A LASTING FINISH** **B**

Dustin Mullet - Dura Coat Products, Inc., Manuel Mayer and Michael Withers - Axalta Coating Systems

**10:30 AM – 12:30 PM****NEW! C50: POWDER COATING AND INDUSTRY 4.0, REALLY?** **A****Powder Coating and Industry 4.0, Really?**

Jeffrey Hale - Gema USA Inc.

**Data Acquisition and the Art of Powder Coating**

Mike Thies - Gema USA Inc.

**C51: IDENTIFY AND SOLVE FINISHING DEFECTS: SEE IT, TOUCH IT, FIX IT** **I**

David Schimpff - DuBois Chemicals, Diego Bertolo - SAMES KREMLIN Inc., Tabitha McLeish and Curt Wild - The Sherwin-Williams Co.

**NEW! C52: DEVELOPING A LIQUID COATING KNOWLEDGE BASE** **B****Basics of Liquid Coatings**

Dan Szczepanik - The Sherwin-Williams Co.

**Building a Knowledge Base of Liquid Application Equipment**

Martin Powell - Carlisle Fluid Technologies

**1:30 PM – 3:30 PM****NEW! C60: AUTOMATION - IS IT FOR EVERYONE?** **I****Levels of Automation in Automated Finishing Systems**

John Claman - IntelliFinishing

**Robotic Paint and Powder Coating**

Mike Dilday - FANUC America



## Finishing Robot Applications for Military and Aerospace Users

Michael Elberson - Autoquip Automation

## **NEW! C61: SAFETY - IT WORKS FOR ALL OF US** I

### Focus on the Codes that Prevent Fires and Explosions

Martin Powell - Carlisle Fluid Technologies

### Safety: It Works for All of Us

Martin Korecky - AkzoNobel Coatings, Inc.

## **NEW! C62: IMPROVING PERFORMANCE OF PRETREATMENT PROCESSES** I

### Best Practices for Manual Pretreatment Applications

Kirk Beaster - Chemetall US, Inc., a BASF Company

### The Game Changer - Greener and More Cost-Effective Phosphatization

Michael Frechette - Hubbard-Hall

### Emerging Technologies and Future Developments of Cleaning and Pretreatment

Chris Berger - Calvary Industries, Inc.

## THURSDAY, NOVEMBER 8

### 8:00 AM - 10:00 AM

## **C70: NEW! TOP 10 TIPS FOR MAINTAINING YOUR POWDER COATING OPERATION** I

Bill Owens - AkzoNobel Powder Coatings, Hector Flores and Joe Glassco - Wagner Industrial Solutions

## **NEW! C71: FROM E-COAT TO TOP COAT** A

### ECoat Prime/Powder or Liquid Top Coat - A First Class Combination

Joe Laubenthal - Therma-Tron-X, Inc.

## Electrodeposition Coatings (E-Coat) Technology - Selecting the Correct Technology to Meet Performance Needs

Kevin Kahl and John Hromadka - The Sherwin-Williams Co.

## **NEW! C72: ADVANCEMENTS IN PRETREATMENT** I

### New Advances in Zirconium Chemistry

David Schimpff - DuBois Chemicals

### 9 Must-Know Reasons to Consider Zr-Based Advanced Pretreatments

Suresh Patel - Chemetall US, Inc., a BASF Company

### 10:30 AM - 12:30 PM

## **NEW! C80: KEY ELEMENTS OF SPRAY BOOTH DESIGN** I

### How Codes Affect Your Spray Booth Design

Robert Hauck - Spray Systems

### Utilizing LED Technology to Best Light Your Booth

Nicole Boss - LDPI Inc.

### Filtration Options for Paint Applications

John Owed - Col-Met Engineered Finishing Solutions

## **C81: ALL ABOUT OVENS** I

### Benefits of Longwave Infrared for Drying, Gelling & Curing Liquid and Powder Coatings

Michael Chapman - Heraeus Noblelight America LLC

### Oven Design Basics - The Cure for Success

Bill Oney - Therma-Tron-X

### Getting the Right Temperature

Robert Hertel - BYK-Gardner USA



## FORMING &amp; FABRICATING

## TUESDAY, NOVEMBER 6

8:00 AM - 10:00 AM

**F13: COIL PROCESSING: ADVANCEMENTS IN SLITTING, LEVELING AND STORAGE** **I****Leveling and Deburring: Modern Metal Processing**

Nicholas Miller - ARKU, Inc.

**Improving Profits by Employing Novel Handling & Storage Solutions: 40 Years of Case Histories**

Michael Baach and Steve Detweiler - Philipott Rubber &amp; Plastics Company

**Slitting Advanced High-Strength Steel**

Al Zelt - ASKO Inc.

**F14: ROLL FORMING: IN-LINE PUNCHING, CUTOFF DIES AND PRESS TONNAGE** **I****Value to Your Rollforming Lines with In-line Punching and Cutoff Dies**

Paul Williams - Hill Engineering/ Formtek Inc.

**When the Press Tonnage Rating Is Really Not the Tonnage in a Roll Forming Line**

Paul Williams - Hill Engineering/ Formtek Inc.

10:30 AM - 12:30 PM

**NEW! F23: PRESS BRAKE SPRINGBACK SOLUTIONS** **I****Overcoming Springback With Proper Tooling Choices**

Larry Boden - Mate Precision Tooling

**Springback - Take The Red Pill**

Steve Benson - ASMA LLC

**F24: WELDING ADVANCEMENTS FOR TUBE & PIPE** **I****Advancements in HF Welding Data Collection and Analytics**

Victor Monreale - Thermatool Corp.

**Advancements in Thermal Imaging for HF Welding Applications**

Grant Huffman - Thermatool Corp.

**Understanding How Shielding Gas Flow Can Improve Quality and Reduce Cost**

Andrew Pfaller - Miller Electric Manufacturing LLC

1:30 PM - 2:30 PM

**F33: PRESS BRAKE SAFETY: ANSI B11.2 EXPLAINED** **I**

Douglas Raff - Paragon Industrial Controls, Inc.

Brian Roberts - CNA Risk Control Services

**NEW! F34: TUBE & PIPE: BENDING** **I****Tube Bending 101 - Overview of Options for Forming Tube and Technical Considerations**

Dan Corray, Lisa Wertzbaugher and Jeff Otten - Superior Tube Products

**Tube Bending - A Black Art?**

Danie Jacobs - Cincinnati Industrial Machinery, Inc.

## WEDNESDAY, NOVEMBER 7

8:00 AM - 10:00 AM

**NEW! F43: SHEET METAL: CONTROLLING COSTS WITH GOOD DESIGN AND EQUIPMENT PURCHASES** **I****Rethinking Sheet Metal Design to Reduce Costs and Improve Manufacturability**

Grant Hagedorn - TRUMPF Inc.

**How To Get More Bang For Your Buck: The Do's and Don'ts of Purchasing A Sheet Metal Fabrication Machine**

Yuksel Taskin - Durma North America Inc.

**NEW! F44: COIL PROCESSING: SLITTING THIN MATERIALS AND LASER BLANKING** **I****Processing Thin, Ultra Thin and Surface Critical Material, Slitting, CTL**

Mike McGuire - Burghardt + Schmidt GmbH

**Flexible and Efficient Blanking with Lasers**

Jay Finn - LaserCoil Technologies, LLC

10:30 AM - 12:30 PM

**NEW! F53: ROLL FORMING: JUSTIFICATION, BASICS AND LUBRICANTS** **B****Justification for Roll Forming**

Brian Rodgers - Formtek, Inc.

**Roll Forming Basics**

Brian Rodgers - Formtek, Inc.

**Modern Lubricants for Roll Form Processes**

David Kinnard - Tower Metalworking Fluids

**F54: EFFECTIVE SAFEGUARDING RISK ASSESSMENT** **B**

Douglas Raff - Paragon Industrial Controls, Inc. and Brian Roberts - CNA Risk Control Services

1:30 PM - 3:30 PM

**NEW! F63: TUBE & PIPE: FORMING AND LUBRICATION** **A****Proven Lubrication for Mandrel Tube Bending**

Christopher Fletcher - Tower Metalworking Fluids

**From Mass Production to Lot Size One - Customized Automation in Tube Forming Production**

Klaus Wurster - WAFIOS Tube Automation

**Modern Tube Bending Machinery**

Greg Miller - Tubular Solutions Inc.

**NEW! F64: HOT FORMING WITH TITANIUM** **I**

Scott Pryer - PRYER Machine, Jeffrey Debus - Beckwood Press Company and Don Voke - Duraloy Technologies

**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F73: ALTERNATE FORMING PROCESSES** **I**

New Development within the Hydroform Technology

Peter Falk - Quintus Technologies

**The Advantageous Alliance of 3D Printing and FluidForming**

Jurgen Pannock and Paul Benny - FluidForming

Americas, LLC

**NEW! F74: ROLL FORMING: TOOLING DESIGN AND ADVANCED TECHNIQUES** **I**

The Basics of Roll Tooling Design

John Kopsick - Formtek Inc.

**Advanced Roll Forming Techniques**

Brian Rodgers - Formtek, Inc.

**10:30 AM – 12:30 PM****NEW! F83: ADVANCED PRESS BRAKE TECHNOLOGIES** **I**

Bending Big: Large Tonnage Applications

Vincent Iozzo - TRUMPF Inc.

**Maximizing Bending Productivity**

Scott Ottens - Amada America Inc.

**How New Press Brake Technologies Help Fabricators Reduce Operator Learning Curve and Experience Level**

Paul LeTang - Bystronic Inc.

**NEW! F84: DIGITAL TRANSFORMATION OF TUBE & PIPE CUTTING** **I**

Digital Transformation of Tube & Pipe Cutting

Adria Haines - Lantek Systems, Inc.

**LEAN****TUESDAY, NOVEMBER 6****8:00 AM – 10:00 AM****NEW! F15: LEAN PRINCIPLE: STRATEGIC PLANNING AND ORGANIZATIONAL ALIGNMENT** **A**

Vince Bovino - Bovino Consulting Group

**10:30 AM – 12:30 PM****NEW! F25: LEAN PRINCIPLE: DEVELOPING YOUR PEOPLE** **I**

How to Build Accountability in Your Organization

Mark Ernst - Ernst Enterprises

**Leading Your Business Forward: Creating and Sustaining High-Performance Organizations**

Seth Davies - Competitive Solutions Inc.

**1:30 PM – 3:30 PM****NEW! F35: LEAN TOOLS: VALUE STREAM MAPPING, ADDRESSING DIFFERENCES BETWEEN OFFICE AND SHOP FLOOR** **I**

Mike Osterling - Osterling Consulting, Inc.

**WEDNESDAY, NOVEMBER 7****8:00 AM – 10:00 AM****F45: LEAN TOOLS: A3 THINKING - DEVELOPING PEOPLE & SOLVING PROBLEMS** **I**

Mike Osterling - Osterling Consulting, Inc.

**10:30 AM – 12:30 PM****F55: LEAN TOOLS: FLOW AND PULL CREATING FLOW IN HIGH-VARIETY ENVIRONMENTS** **I**

Kevin Duggan - Institute for Operational Excellence

**1:30 PM – 3:30 PM****NEW! F65: LEAN PRINCIPLE: CONTINUOUS IMPROVEMENT IN LEAN CULTURE** **B**

Flavors of Improvement: Choosing the Right Improvement Approach for your Business

David Hicks - Auburn University

**How to Incorporate Information Technology Into Your Continuous Improvement/Lean Culture**

Bridget Lazlo - Guardian Business Solutions, Inc.

**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F75: LEAN TOOLS: ADVANCED LEAN DESIGN AND PREVENTATIVE (PM) AND PREDICTIVE MAINTENANCE STRATEGIES** **I**

Using Simulation Modeling for Advanced Lean Manufacturing Design

Jason Merschat - Advanced Process Optimization, Inc.

**Preventing Injuries By Implementing Preventative (PM) and Predictive Maintenance Strategies**

Michael Schlagenhauser and Gwendolyn Arps - Acuity

**10:30 AM – 12:30 PM****F85: LEAN TOOLS: LEAN JOURNEY CASE STUDIES AND LESSONS LEARNED** **B**

Jeff Sipes - Back2Basics, LLC, Rich Steel, Jerry Stahlman and Dave Harris - Miller Welding & Machine Co.

## MANAGEMENT

**TUESDAY, NOVEMBER 6****8:00 AM – 10:00 AM****F16: FUNDAMENTALS OF ACTIVITY-BASED COSTING & ESTIMATING** **I****What Does the Perfect Order Look Like?**

Kevin Seefried - TwinEngines, Inc.

**Job Shop Costing and Estimating**

Don Clutter - MIE Solutions

**Activity-Based Costing - Are Your Jobs Really Profitable?**

David Lechleitner - KeyedIn Solutions

**10:30 AM – 12:30 PM****NEW! F26: RISING ABOVE IT ALL: THE ART AND SCIENCE OF ORGANIZATIONAL TRANSFORMATION** **I**

John Lee - Alpha Training and Consulting

**1:30 PM – 3:30 PM****NEW! F36: BECOMING A LEARNING LEADER AND AVOIDING THE FATAL FLAWS OF FAILURE - PART I AND PART II** **I**

Joseph Mazzeo - Integrated Lean and Quality Solutions, LLC

**WEDNESDAY, NOVEMBER 7****8:00 AM – 10:00 AM****NEW! F46: INNOVATION & BUSINESS STRATEGIES FOR GROWTH** **I****The Top 5 Leadership Actions to Easily Accelerate Your Results and Exceed Your Targets**

David Tweedt - Win Enterprises, LLC

**Business Builders: Growth Strategies in a Bustling Economy**

Mark Frasco - COACT Associates, Ltd.

**10:30 AM – 12:30 PM****NEW! F56: WHAT'S YOUR BUSINESS WORTH & PATENT RIGHTS FOR YOUR IP** **I****What is Your \$2M, \$5M, \$10M, \$25M, \$50M and \$100M Revenue Metal Fabrication Business Worth?**

Matthew Bradbury and Bobby Lewis - Business Acquisition &amp; Merger Associates

**Patent Rights in Metal Processing**

Marshall Honeyman - Erise IP

**1:30 PM – 3:30 PM****F66: SUCCESSION STRATEGIES TO PROTECT YOUR BUSINESS** **B****Conquering Family Business Conflict and Succession**

Henry Hutcheson - Family Business USA

**Don't Kill Your Golden Goose – Succession Strategies to Protect & Perpetuate Your Business**

Larry Oxenham - American Society for Asset Protection

**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F76: MANAGING INNOVATION IN 21ST CENTURY BUSINESS** **I****Managing Innovation in 21st Century Business**

Cullen Hackler - Porcelain Enamel Institute

**Paving a Strategic ROADMAP™ to Success**

Andy Shafer - Shafer's Innovation and Business Building Services

**10:30 AM – 12:30 PM****NEW! F86: LEADERSHIP DEVELOPMENT FOR MILLENNIALS** **B**

Cullen Hackler - Porcelain Enamel Institute

**1:30 PM – 3:30 PM****NEW! F96: TAX REFORM, TAX CREDITS & BRINGING MANUFACTURING BACK TO AMERICA** **B****It's Time to Bring Manufacturing Back to America**

Rosemary Coates - Reshoring Institute at University of San Diego

**Tax Reform to Boost M&A Activity**

Vincent Pappalardo - Brown Gibbons Lang &amp; Company

**Building a Competitive Advantage for Your Business Through R&D Tax Credits**

John Madsen - Black Line Group



MARKETING & SALES TOOLS

**TUESDAY, NOVEMBER 6**

10:30 AM - 12:30 PM

**NEW! F27: INCREASE YOUR ROI WITH DIGITAL MARKETING FOR MANUFACTURERS** **I**

**Why Manufacturers Can't Afford to Ignore Digital Marketing in 2019**

Stoney deGeyter - Pole Position Marketing

**Digital Marketing for Contract Fabricators/Using Data for Continuous Improvement**

Tim Doyle - TopSpot

1:30 PM - 3:30 PM

**NEW! F37: MARKETING BOOTCAMP: TECHNOLOGY, PROSPECTS & VOICE OF THE CUSTOMER** **B**

**Marketing Technology Boot Camp 2018 - How Fabricators Can Acquire More of the Right Kind of Customers**

Dan Konstantinovskiy - RH Blake

**Learn How to Conduct Powerful, Fact Based Voice of the Customer Research**

Brian Kent - Fairmont Concepts

**Attract, Convert, Close, and Delight Your Prospects with Inbound Marketing**

Nicole Wagner - Stevens & Tate Marketing

**WEDNESDAY, NOVEMBER 7**

8:00 AM - 10:00 AM

**NEW! F47: 5 STEPS TO WORLD-CLASS CUSTOMER EXPERIENCES** **B**

Bill Sterzenbach - Upward Brand Interactions

10:30 AM - 12:30 PM

**NEW! F57: SALES & MARKETING PERFORMANCE MANAGEMENT OF PEOPLE & SYSTEMS** **I**

**Sales and Marketing Systems for Scalable Growth in Advanced Manufacturing and Capital Equipment**

Michele Nichols - Launch Team, Inc.

**Business Builders: Performance Management of the Sales and Marketing Functions**

Mark Frasco - COACT Associates, Ltd.

1:30 PM - 3:30 PM

**NEW! F67: ACTIONABLE MARKETING STRATEGIES FOR COMPETITIVE ADVANTAGE** **I**

**You Are Going About Revenue Growth All Wrong - Why Everyone In Your Organization Needs To Understand Inbound**

Todd Hockenberry - Top Line Results

**Top Lead Generation Methods for Manufacturers**

Chip Burnham - Fairmont Concepts

**Four Actionable Marketing Strategies to Improve Lead Generation Results**

Dan Gartlan - Stevens & Tate Marketing

**How Distributors Can Make the Most Out of Their Co-op(portunities)**

Tim Rasmussen - Rivet MRO

## SMART MANUFACTURING

**TUESDAY, NOVEMBER 6****10:30 AM – 12:30 PM****NEW! F28: ROADMAP TO SMART MANUFACTURING TRANSFORMATION I****Smart Manufacturing: Why Should I Care? Where Do I Start?**

Will Healy - Balluff, Inc.

**Building a Roadmap to Digital Manufacturing Transformation**

Eric Fogg and Graham Immerman - MachineMetrics

**Realizing Competitive Advantage From the IoT on a Budget: Yes You Can!**

Christine Hansen - Epicor Software Corporation

**Real-World Scenarios in Transformation**

Jeff Carr - Ultra Consultants

**1:30 PM – 3:30 PM****NEW! F38: SMART MANUFACTURING TECHNOLOGY & WORKFORCE READY B****Smart Factory, Industrial IoT, and Industry 4.0 Technical Perspective**

Eric Trexler, Jonathan Kim and Andrew Hwang - Amada America Inc.

**Developing a Smart Manufacturing Ready Workforce**

Jeannine Kunz - Tooling U-SME

**Transdisciplinary Education: Preparing Students for the Smart Factory**

Yuri Hovanski and Andrew Nemrow - Brigham Young University

**WEDNESDAY, NOVEMBER 7****8:00 AM – 10:00 AM****NEW! F48: THE HUMAN AND DIGITAL ROLE IN THE FACTORY OF THE FUTURE I****The Human Role In the Factory of the Future**

Shannon Bennett - Visual Knowledge Share

**Digitize & Thrive: An Interactive Presentation for Determining Your Location on the Path to Industry 4.0**

Kevin Must and Adria Haines - Lantek Systems, Inc.

**1:30 PM – 3:30 PM****NEW! F68: ACTIONABLE INTELLIGENCE: MANAGE DATA TO ENABLE GOOD DECISIONS A****Actionable Intelligence - IoT That Matters**

Kris Scherm - Multicam

**Integrating Quality and Operational Data into Manufacturing/Industry 4.0**

Mark Roos - ATS Applied Tech Systems, LLC

**Physical and Cyber Security on the Shop Floor: NIST 800-171 and Return on Investment**

Rob Dolci - Aizoon

**THURSDAY, NOVEMBER 8****8:00 AM – 10:00 AM****NEW! F78: SMART MANUFACTURING SUPPLY CHAIN & REAL-WORLD CASE STUDIES I****The Future of Analytics and the Supply Chain**

Kevin Must and Adria Haines - Lantek Systems, Inc.

**Improving Profitability and OTIF by Using Product Segregation and Rationalization as a Tool for Strategic Decisions**

Ruben Mirensky - IMCO Associates, Inc.

**Internet of Things Meets Kanban: An Updated Take on Inventory Control and E-kanban**

David Beauchamp - xTuple

**10:30 AM – 12:30 PM****NEW! F88: SMART MANUFACTURING PRODUCT DEVELOPMENT PROCESS: GET TO MARKET FASTER I**

James Ullum - Source International

## STAMPING

## TUESDAY, NOVEMBER 6

10:30 PM – 12:30 PM

**NEW! S20: MACHINE SAFETY - SAFEGUARDING OVERVIEW** 

Roger Harrison - Rockford Systems, LLC

**NEW! S21: LUBRICATION TECHNOLOGY** **LUBRI-NOMICS - The Science of Lubrication and Economics in Metal Stamping**

Bob Anderson and Christopher Fletcher - Tower Metalworking Fluids

**Chlorinated Metal Working Fluids - Fact, Fiction & Options**

Bob Anderson and Christopher Fletcher - Tower Metalworking Fluids

1:30 PM – 3:30 PM

**NEW! S30: MACHINE SAFETY - ALTERNATIVE METHODS FOR APPLYING HAZARDOUS ENERGY CONTROL** 

Ted Sberna - White Horse Safety

**NEW! S31: SENSOR TECHNOLOGY - ELIMINATING DIE CRASHES** 

Jim Finnerty - Wintriss

## WEDNESDAY, NOVEMBER 7

8:00 AM – 10:00 AM

**NEW! S40: SENSOR TECHNOLOGY - PRACTICAL APPLICATIONS** **Making Sense of Sensors for Metal Forming & Assembly**

George Keremedjiev - Tecknow Education Services, Inc.

**Automatic In-Die Part-Quality Monitoring & Tool Adjustments**

James Barrett - Link Systems, Inc.

**NEW! S41: STAMPING AHSS MATERIALS** **Introduction to AHSS Properties**

Peter Ulintz - Precision Metalforming Association

**Taking the Kinks Out of Straightening 1000+ MPa Steels**

Hunter Coe and Tom Brockie - COE Press Equipment

**Tooling Optimization for AHSS Applications**

Jeremy Edson - Wilson Tool International

10:30 AM – 12:30 PM

**NEW! S50: ADVANCE PRESS ROOM TECHNOLOGY** **Applications of Real-Time and Non-Destructive Evaluation Tools to Achieve First-Time Quality Stampings**

Hyunok Kim - EWI

**Case Studies of IO-Link Modernizing the Press Shop**

Will Healy - Balluff, Inc.

**NEW! S51: SOLVING PROGRESSIVE DIE PROBLEMS** 

Peter Ulintz - Precision Metalforming Association

1:30 PM – 3:30 PM

**NEW! S60: SENSORS, CONTROLS AND CONNECTIVITY** **Creating a Die Protection Program on a Limited Budget**

George Keremedjiev - Tecknow Education Services, Inc.

**Controls and Connectivity: Collecting and Moving Data From the Shop to the Office**

Jim Finnerty - Wintriss

**NEW! S61: PREVENTATIVE MAINTENANCE IN THE PRESS ROOM** 

Jeffery Fredline - CNC Press Repair

## THURSDAY, NOVEMBER 8

8:00 AM – 10:00 AM

**NEW! S70: SHEET METAL PROPERTIES, DEFORMATION MODES AND SIMULATION EXPERIMENTS** **Material Properties and Deformation Modes: Keys for Solving Metal Forming Problems**

Peter Ulintz - Precision Metalforming Association

**Design of Experiments in Process Simulation**

James Miller and John Walters - Scientific Forming Technologies Corp.

**NEW! S71: TRANSFER SYSTEM TECHNOLOGY** **Sensing Fundamentals and Technical Sensing Solutions Found in Progressive and Transfer Stamping**

David Bird and Shawn Day - Balluff, Inc.

**Press Mounted Transfer Systems**

Rodney Naseman - Wayne Trail, a Lincoln Electric Company

10:30 AM – 12:30 PM

**NEW! S80: STAMPING PROCESS OPTIMIZATION** 

Kidambi Kannan - AutoForm Engineering USA Inc.

**NEW! S81: APPRENTICESHIP PROGRAM FOR PRESSROOM TECHNICIANS** 

George Keremedjiev - Tecknow Education Services, Inc.



**WELDING FABRICATION**

**TUESDAY, NOVEMBER 6**

**10:30 AM – 12:30 PM**

**NEW! W20: WELDING FOR STEEL AND ALUMINUM APPLICATION I**

**Practical Considerations Required for Proper Fabrication & Repair Welding of Duplex & Superduplex Stainless**

John Stoll - voestalpine-Bohler Welding USA, Inc.

**Improve Productivity by Welding with AC Pulse on Thin Aluminum**

Michael Klee - Lincoln Electric Company of Canada

**How To Keep Stainless... 100% Stainless**

Robert Saunders - voestalpine Bohler Welding USA, Inc.

**Wire-Based Additive Manufacturing of Aluminum Parts**

Shuang Liu - Miller Electric Manufacturing LLC

**1:30 PM – 3:30 PM**

**NEW! W30: WELDING FOR LASER & CUTTING REPAIR TECHNOLOGY I**

**Automated 2D/3D Sensing for Remote Laser Welding Applications**

Thibault Bautze - Precitec GmbH & Co. KG

**Timelines in Field Welding Drive Need for Versatile and Portable Products**

Andrew Pfaller - Miller Electric Manufacturing LLC

**Laser Hot Wire Processing for Cladding and Additive Manufacturing Applications**

Maxwell Radke - Wayne Trail Technologies

**WEDNESDAY, NOVEMBER 7**

**8:00 AM – 10:00 AM**

**NEW! W40: WELDING OF ADVANCED AND SPECIALTY MATERIALS I**

**Modeling of Severe Plastic Deformation in Mash Seam Welding using Improved Electro-Thermo-Mechanical Simulation**

Alexey Kuprienko - The Ohio State University

**Friction Stir Welding of Hot Rolled and Annealed Armor Steel**

William Evans - The Ohio State University

**DeltaPoint Manifold with Water Extraction Technology (WET)**

Peter Hackett - Universal Flow Monitors

**Deoxidation & Welding Implications in Super-Austenitic Grades**

David O'Donnell - RathGibson

**10:30 AM – 12:30 PM**

**NEW! W50: LEAN & QUALITY WELDING FOR SMART MANUFACTURING I**

**Total Weld Quality Management System - Big Data Turned into Action**

Jeffrey Noruk - Servo Robot Corporation

**Lean Manufacturing in Anodizing Aluminum**

Thiru Munisamy - Raytheon

**Impact of Exoskeletons on Welding Safety, Quality, and Productivity**

Terry Butler - Lean Steps Consulting Inc.

**NEW! W60: FUNDAMENTALS OF WELDING PROJECT SUCCESS I**

Mike Lang, Welding and NDE Services



WORKFORCE DEVELOPMENT

**TUESDAY, NOVEMBER 6**

**8:00 AM - 10:00 AM**

**NEW! F19: 8 ELEMENTS TO EFFECTIVE DELEGATION & HOW TO GET MORE FROM THE PEOPLE YOU'VE GOT** **B**

**8 Elements to a More Effective Delegation**

Mark Ernst - Ernst Enterprises

**How to Get 25% More from the People You've Got - Three Proven Shortcuts to Increase Output During Low Unemployment**

Charles DeBettignies - Gainsharing Inc.

**10:30 AM - 12:30 PM**

**NEW! F29: INNOVATIVE TECHNIQUES TO MANAGE SIGNIFICANT IMPROVEMENT AND CHANGE INITIATIVES** **I**

**Managing Complex Change: "The Challenge of Implementing a Significant Improvement Initiative"**

Gary Higbee - SafeStart®

**Change is RUNNING At You...Are You Ready?**

Paul Vragel - 4aBetterBusiness, Inc.

**1:30 PM - 3:30 PM**

**NEW! F39: THE BEAUTY OF BEING LOST: MAKE BETTER DECISIONS & LEAD CHANGE IN YOUR ORGANIZATION** **I**

**The Beauty of Being Lost While Leading a Change**

Noa Ronen - Noa Ronen Coaching

**Making Better Decisions**

Dan Ryan - Ryan Search & Consulting

**How to Lead a Change Initiative**

Mark Ernst - Ernst Enterprises

**WEDNESDAY, NOVEMBER 7**

**8:00 AM - 10:00 AM**

**F49: MANUFACTURING AND THE MILLENNIAL: HOW TO ATTRACT AND RETAIN EMERGING LEADERS** **B**

**Manufacturing and the Millennial Generation: Tips for Recruitment, HR, and Sales**

Josh Curcio - protocol 80, Inc.

**Engaging Manufacturing's Next Generation through Full Contact Innovation**

Bill Padnos - NTMA

**Millennials and the Future of Manufacturing - How to Attract and Retain Future Talent**

Joseph Mazzeo - Integrated Lean and Quality Solutions, LLC



**10:30 AM – 12:30 PM**

**NEW! F59: ACCOUNTABILITY, ENGAGEMENT & A CULTURE THAT ROCKS** **I**

Pete Winiarski - Win Enterprises, LLC

**1:30 PM – 3:30 PM**

**F69: ACCELERATING WORKFORCE PERFORMANCE THROUGH BEST PRACTICES IN LEARNING AND DEVELOPMENT** **I**

John Hindman - Tooling U-SME

**THURSDAY, NOVEMBER 8**

**8:00 AM – 10:00 AM**

**NEW! F79: CAREER-PATHING & BUILDING ADVANCED MANUFACTURING PIPELINES** **B**

**5 Steps to Creating a Successful Career-Pathing Program**

Mark Ernst - Ernst Enterprises

**Advanced Manufacturing Training**

Hernán Luis y Prado - Workshops for Warriors

**10:30 AM – 12:30 PM**

**NEW! F89: ENGAGING, RETAINING & FILLING OPEN POSITIONS: DO MORE WITH LESS** **B**

**Attract, Recruit, Retain - Win The War For Talent**

Greg Lee - WorldBridge Partners

**Do You Really Need to Fill All Those Open Positions? Learn How to Do More with Less.**

Chuck Mouranie and Ken Mall - EDSI

**Mastering the Millennial Mindset: How to Attract and Retain Emerging Leaders**

Lisa Ryan - Grategy.com

**1:30 PM – 3:30 PM**

**NEW! F99: LEVERAGE CULTURE TO COMMUNICATE & DELIVER BREAKTHROUGH RESULTS** **I**

**Break Out of Your Cultural Comfort Zone to Communicate Globally**

Annalisa Nash Fernandez - Because Culture

**Leveraging Culture to Deliver Breakthrough Results**

Amir Ghannad - The Ghannad Group, LLC





# TAKE CONTROL

*Introducing the NEW ADVANCED 800 eX-F Series Laser*

## A New Level of Productivity.

Mitsubishi Laser is the fastest growing FIBER company in the industry. Find out why our ZOOM Fiber technology is racing to the top of the market. If you are looking for more production, less maintenance, and an overall reduction in operating cost look no further than Mitsubishi. Our latest eX-F Advance 800 features the latest Mitsubishi 800 control which provides a 19 inch touch screen control and a *smartphone-like* user interface.



**MC** MACHINERY  
SYSTEMS, INC.

a subsidiary of Mitsubishi Corporation

To schedule a test cut or a free machine demo,  
contact us today at 630-616-5751 or visit us at [www.mcmachinery.com](http://www.mcmachinery.com)

**TUESDAY, NOVEMBER 6****8:00 AM – 5:00 PM****W10: NDT DAY**

This seminar will provide the fundamental knowledge of radiography and of penetrant testing required by inspectors, quality assurance, and test personnel.

Scott Helzer, AWS Instructor

**TUESDAY, NOVEMBER 6 –  
WEDNESDAY, NOVEMBER 7****8:00 AM – 5:00 PM****W13: CWI PART B HANDS-ON  
EXPERIENCE**

Learn to review WPSs and WPQRs for completeness and accuracy. Excellent preparation for Part B of the CWI Exam for those pursuing the Certified Welding Inspector credential.

Mike Carey, AWS Instructor

**W14: WELDING OF STAINLESS STEELS**

- Applications of Stainless Steel Welding: Part 1 – The Basics
- Applications of Stainless Steel Welding: Part 2 – Avoiding Defects

Richard Campbell, AWS Instructor

**WEDNESDAY, NOVEMBER 7****8:00 AM – 5:00 PM****W11: THE WHY AND HOW OF WELDING  
PROCEDURE SPECIFICATIONS**

This two-part session revisits the fundamentals of WPSs for those individuals seeking to become more proficient in the authoring and application of a WPS in fabrication and offers a hands-on approach to advanced instruction in the formulation and writing of WPSs.

Scott Helzer, AWS Instructor

**THURSDAY, NOVEMBER 8****8:00 AM – 4:15 PM****W12: METALLURGY APPLIED TO  
EVERYDAY WELDING**

Learn how welding affects the properties of base materials and how weld defects occur.

Scott Helzer, AWS Instructor

**8:30 AM - 12:30 PM****W15: BETTER UNDERSTANDING OF  
WELDING SYMBOLS**

The goal of this seminar is to provide a good understanding of AWS welding symbols, with explanations of their proper and improper use.

Richard Campbell, AWS Instructor

**RWMA RESISTANCE  
WELDING SCHOOL****TUESDAY, NOVEMBER 6 –  
WEDNESDAY, NOVEMBER 7****8:00 AM – 4:15 PM****W22: RWMA RESISTANCE WELDING  
SCHOOL**

Start preparing for the upcoming Certified Resistance Welding Technician (CRWT) certification exam at the Emmett A. Craig RWMA Resistance Welding School. Offered only once each year, and presented by industry experts, this is an intensive two-day course covering the fundamentals of Resistance Welding. The course is designed for personnel in a variety of roles, such as Welding & Production Managers & Supervisors, Engineers & Technicians, Setup and Senior Operators, Trainers & Educators. Students emerge from the course with a better understanding of Resistance Welding Fundamentals, from Theory to Application Requirements to Equipment used in various resistance welding processes.

The focused learning environment better prepares those new to Resistance Welding, and further educates the experienced. Day One discusses the process and machines, materials, electrodes and power systems associated with resistance welding. Day Two explores resistance welding controls, quality standards, machine setup and maintenance. The school concludes with a panel discussion where students are encouraged to discuss their specific applications with all of the instructors.

## CAREER PATH WORKSHOPS

**TUESDAY, NOVEMBER 6****10:00 AM – 12:00 PM****NEW! W16: STARTING A WELDING INSPECTION BUSINESS**

What is required legally to go into business for yourself as a consultant? Learn from successful entrepreneurs who made welding inspection work for them.

**1:00 PM – 3:00 PM****NEW! W17: CREATING A WPS IN 60 SECONDS**

Learn how to save time and money by creating accurate and prequalified WPSs, or even more specialized welding procedures safely by using technology.

**3:00 PM – 5:00 PM****NEW! W18: WELDING ENGINEER'S ROUND TABLE DISCUSSION**

Meet a panel of knowledgeable welding engi-

neers and experts from various industry sectors who will share their experiences of how they chose welding as a career, how they became welding engineers and address some of the issues they face on a daily basis.

**WEDNESDAY, NOVEMBER 7****9:00 AM – 11:00 AM****NEW! W19: GETTING STARTED IN UNDERWATER WELDING**

Did you know that underwater welders are among the highest paid of all welders? Come learn from an international industry expert about the opportunities available and the skills you can develop.

**1:00 PM – 2:30 PM****NEW! W21: OPPORTUNITIES IN WELDING**

Learn about different specialties within the welding industry that will help you find jobs quicker and earn more money.

## PROFESSIONAL PROGRAM

Pick and choose between concurrent sessions for the latest in welding research and commercial developments. Pick a day or attend the entire three-day program.

**TUESDAY, NOVEMBER 6****SESSION 1: ADDITIVE MANUFACTURING**

Session Chair: A. Black, Los Alamos National Laboratory

**8:00 AM****Laser Additive Manufacturing of Grade 91 Steel for Radiation Tolerant Nuclear Components**

T. Lienert, S. Maloy, E. Aydogan, B. Eftink, T. Steckley, J. Weaver, and R. Pacheco, Los Alamos National Laboratory

**8:20 AM****Manufacturing Tooling with Smart Wire-Arc Metal Large Scale Printing System**

A. Nycz, M. Noakes, C. Masuo, and L. Love, Oak Ridge National Laboratory

**8:40 AM****Effect of Powder Characteristics and Delivery Method on the Quality of Manufactured Powder-Cored Tubular Wires**

E. Sullivan and S. Liu, Colorado School of Mines & Tech

**9:00 AM****Microstructure and Mechanical Properties of Fe-10Ni Steel Additively Manufactured Using Laser Powder Bed Fusion (L-PBF)**

D. Bechetti and M. Sinfield, Naval Surface Warfare Center, Carderock Division, E. Barrick and J. DuPont, Lehigh University; R. Fonda, Naval Research Laboratory

**9:20 AM****Effect of Sample Geometry and Process Parameters on Microstructure Evolution of Nickel-Base Superalloy Fabricated by Laser-Powder Bed Fusion Additive Manufacturing**

H. Song, EWI

**9:40 AM****Microstructure and Mechanical Properties of WAAM Duplex Stainless Steel Tube**

F. Binesh, Clarkson University

**10:00 AM****Wire-Based Additive Manufacturing of Aluminum Parts**

S. Liu, Miller Electric Manufacturing LLC

**10:20 AM****Solidification Behavior of Additively Manufactured 304L Stainless Steel**

D. Wilson, Honeywell FM&T; S. Liu, Colorado School of Mines; J. Rodelas and M. Maguire, Sandia National Laboratories

**10:40 AM****Recent Investigations into Additive Manufacturing for Navy Sustainment**

E. Reutzel, S. Brown, and R. Martukanitz, ARL Penn State / CIMP-3D; G. Welsh, NAVAIR - PAX River; M. Sapp, NAVAIR - FRC-East; E. Petran, NAVSEA - PHNSY

**11:00 AM****Multi-Robot Collaborative Wire Arc Additive Manufacturing**

S. Chen, Beijing University of Technology

**11:20 AM****Study on Thermogenesis Mechanism and Melting Behavior of Resistance Heating Wire Welding Forming**

C. W. Yuan, S.J. Chen, F. Jiang, No. 100 Ping Paradise, Chaoyang District, Beijing

**TUESDAY, NOVEMBER 6****11:40 AM****Laser Hot Wire Processing for Cladding and Additive Manufacturing Applications**

M. Radke, The Lincoln Electric Company

**SESSION 2: MODELING AND NUMERICAL ANALYSIS I**

Session Chair: W. Zhang, The Ohio State University

**8:00 AM****Formula for Predicting Weld Size, HAZ, Cooling Rate, and More**

P. Mendez, University of Alberta

**8:20 AM****Development of Materials Evolution Modeling for ICME Framework**

E. Brizes, W. Zhang, and A. Ramirez, The Ohio State University Welding Engineering; T. Abke, Honda R&D Americas

**8:40 AM****Engineering Expressions for Characteristic Values of Isotherms Based on a Moving Point Heat Source**

Y. Wang and P. Mendez, University of Alberta

**9:00 AM****Deep Learning to Recognize Welding Microstructures in Structural Steels**

A. Hintze Cesaro and P. Mendez, Canadian Centre for Welding and Joining, University of Alberta; K. Wang, S. Shah, University of Alberta

**9:20 AM****Numerical and Physical Simulation of High Frequency-Electric Resistance Welding (HF-ERW) Process**

R. Kannan and L. Li, Univ of Alberta; M. Rashid, A. Ray, and L. Collins, EVRAZ Inc. NA, Regina, Saskatchewan

**9:40 AM****Uncertainty Analysis in Computational Weld Mechanics Based Simulations Due to Input Material Property Data**

C. Fisher and D. Bechetti, Naval Surface Warfare Center – Carderock; M. Schuh, Wheaton College; W. Zhang and J. Semple, The Ohio State University

**10:00 AM****A Validated Computational Study on Heat Generation Mechanisms in Ultrasonic Welding Joint**

H. Huang, J. Chen, Y. C. Lim, Z. Feng, and X. Sun, Oak Ridge National Laboratory

**10:20 AM****Multiscale Modeling and Damage Zone Analysis of Ni-Based Super Alloy Braze Joints for High Temperature Gas Turbine Applications**

J. Wildofsky, The Ohio State University

**10:40 AM****Comparative Study on Implicit and Explicit FEM for Stress Analysis of Metal Additive Manufacturing**

H. Huang, J. Chen, and Z. Feng, Oak Ridge National Laboratory

**11:00 AM****A Novel Approach to Predict Safe Welding Conditions to Avoid Cold Cracking of Welds**

R. El-Hebeary, Faculty of Engineering, Cairo University

**11:20 AM****A Combined Solid-Shell Model for Predicting Weld Residual Stress on Large Ship Panels**

Y.-P. Yang and R. Dull, EWI; T.D. Huang and S. Scholler, Ingalls Shipbuilding

**SESSION 3: WELDING METALLURGY**

Session Chair: Boian Alexandrov, The Ohio State University

**8:00 AM****Microstructure Characterization and Mechanical Property Evaluation of Fe-10Ni Steel Weld Metal**

E. Barrick and J. DuPont, Lehigh University; M. Sinfield, J. Farren, and D. Bechetti, Naval Surface Warfare Center, Carderock Division; P. Ray, Carpenter Technology Corporation

**8:20 AM****Effects of Niobium on Weld Metal Microstructure and Properties of Submerged Arc Welds in X70 Steel**

T. Patterson and J. Lippold, The Ohio State University

**8:40 AM****High Temperature Mechanical Behavior of Grade 91 Steel Dissimilar Metal Welds with Nickel Based Filler Metals**

M. Kuper and B. Alexandrov, Ohio State University; J. Burgess, GE Power

**9:00 AM****Preliminary Investigations into LME Induced Failures in Advanced High Strength Steels**

D. Sage and C. Fink, Ohio State University

**9:20 AM****Microstructural Evolution of Dissimilar Metal Welds Involving Grade 91**

S. Orzolek and J. DuPont, Lehigh University; J. Seifert, EPRI

**9:40 AM****In-situ Observation of Creep-Fatigue Behavior of Grade 91 Weldments**

K. Zhang, W. Zhang, M. Mills, C. Whitt, and A. Kuprienko, Ohio State University

**10:00 AM****Active Metal Brazing of SiC using CoSiVTi Braze Alloy**

J. Wei, S. Liu and J. C. Madeni, Colorado School of Mines

**10:20 AM****Influence of Multi-Pass Weld Thermal Cycles on the Microstructure and Hardness of Maraging Steels 17-4 and 13-8+Mo**

J. DuPont, Lehigh University; R. Hamlin, Knolls Atmoc Power Lab; C. Robino, Sandia National Laboratories

**10:40 AM****Impact of Multi-pass Welding Thermal Cycles on Root Pass Microstructure in Super Duplex Stainless Steel (UNS S32750) Welds**

T. Pickle, N. Henry and R. Baumer, LeTourneau University

**11:00 AM**

**Fundamental Relationship between Indentation Techniques and Toughness Applied to Temper Bead Qualification**

B. Smith, Ohio State Welding Engineering

**11:20 AM**

**Distribution of Mechanical Properties in Dissimilar Titanium-Stainless Steel Joints Determined through Nanoindentation**

B. Schneiderman, S. Gilbert, Z. Yu, and S. Liu, Colorado School of Mines; L. Lindamood and J. Gould, EWI; J. Li, A. Vivek, and G. Daehn, The Ohio State University

**11:40 AM**

**Influence of Multiple Weld Thermal Cycles on Mechanical Properties of HSLA 100**

J. Duch and J. DuPont, Lehigh University

**SESSION 4: SENSING AND CONTROL OF WELDING PROCESSES**

Session Chair: Y. M. Zhang, University of Kentucky

**2:00 PM**

**Real-Time Control of Critical Penetration in GTAW**

C. Li, J. Chen, and Y. Zhang, University of Kentucky; Y. Shi, Lanzhou University of Technology

**2:20 PM**

**Defect Detection of GTAW from Reversed Electrode Images and Data Driven Models**

Z. Chen, J. Chen and Z. Feng, Oak Ridge National Laboratory

**2:40 PM**

**Experimental Sensing of Fluid Flow and Temperature Profile in High Speed GMAW with External Magnetic Field**

C.S. Wu, Institute of Materials Joining, Shandong University

**3:00 PM**

**Synchronous Fusion of Heterogeneous Data for Real-Time Weld Quality**

J. Steele and A. Ayoade, Colorado School of Mines

**3:20 PM**

**Joint Base GTAW Weld Pool Penetration by Image Pattern Sensor**

Y-T. Chen, J. Chen, and Y.M. Zhang, University of Kentucky

**3:40 PM**

**Microscopic Characterization and Correlation Analysis with On-line Welding Spectroscopy for Porosity of Aluminum Alloy in Pulsed GTAW**

Z. Zhang and G. Wen, Xi'an Jiao Tong University

**4:00 PM**

**A Novel Piezo-Actuator Enhanced Resistance Spot Welding Process**

N. Wu, S. Chen, J. Xiao, and C. Hu, Beijing University of Technology; W. Zhang, The Ohio State University

**4:20 PM**

**Identification of Weld Penetration Control System and Its Control Strategies for Pulsed Gas Metal Arc Welding**

W. Wang, Z. Wang, S. Hu, and Y. Cao, Tianjin University

**4:20 PM**

**Identification of Weld Penetration Control System and Its Control Strategies for Pulsed Gas Metal Arc Welding**

W. Wang, Z. Wang, S. Hu, and Y. Cao, Tianjin University

**4:40 PM**

**Virtual Reality Human Robot Collaborative Welding System**

Q. Wang and Y.M. Zhang, University of Kentucky

**SESSION 5: SOLID-STATE PROCESSES**

Session Chair: Z. Yu, Colorado School of Mines

**2:00 PM**

**Friction Stir Welding of Hot Rolled and Annealed Steel for Military Applications**

W. Evans and A. Ramirez, The Ohio State University; M. McDonnell, U.S. Army TARDEC; M. Eff, EWI

**2:20 PM**

**Axisymmetric Tube Shearing, Forming and Welding Realized by Vaporizing Foil Actuators**

J. Li, A. Vivek, and G. Daehn, The Ohio State University

**2:40 PM**

**Dissimilar Friction Welding of Titanium Alloy to Steel Rods**

P. Li and H. Dong, School of Materials Science & Engineering, Dalian University of Technology

**3:00 PM**

**Ultrasonic Welding of AZ31B Magnesium and Galvanized DP590 Steel**

J. Chen, H. Huang, Y. C. Lim, Z. Feng, and X. Sun, Oak Ridge National Laboratory

**3:20 PM**

**Joining of Carbon Fiber Reinforced Composite to Magnesium Alloy by Friction Self-Piercing Rivet**

Y. C. Lim, C. Warren, J. Chen, and Z. Feng, Oak Ridge National Laboratory

**3:40 PM**

**Role of Interlayer on Vaporizing Foil Actuator Welding of Aluminum-Stainless Steel**

S. Su and S. Chen, Beijing University of Technology; Y. Mao, A. Vivek, and G. Daehn, The Ohio State University

**4:00 PM**

**Modeling of Severe Plastic Deformation in Mash Seam Welding using Improved Electro-Thermo-Mechanical Simulation**

A. Kuprienko, W. Zhang, M. Kimchi, and Y. Lu, The Ohio State University; B. Krakauer, A. O. Smith

**4:20 PM**

**The Influence of the Offset for Preheating Arc on the Performance of Friction Stir Welding 2219-T87 Aluminum Alloy**

X. Li, S. Chen, and T. Yuan, Beijing University of Technology

**4:40 PM**

**Atomic Scale Characterization of Al-Steel Welds Fabricated in the Solid State**

N. Sridharan, J. Poplowsky, and H. Meyer, Oak Ridge National Laboratory; A. Vivek and G. Daehn  
G. Daehn, The Ohio State University

## PROFESSIONAL PROGRAM

**SESSION 6: WELDABILITY STUDIES**

Session Chair: C. Fink, The Ohio State University

**2:00 PM****Stress Relief Cracking Susceptibility of High Temperature Alloys**

R. Kant and J. DuPont, Lehigh University

**2:20 PM****Effect of Interstitial Elements on the Solidification Behavior of High Chromium, Nickel Base Filler Metals**

L. Aguilar and C. Fink, The Ohio State University; S. McCracken, Electric Power Research Institute

**2:40 PM****Establishing an Industry Standard Practice for the Delayed Hydrogen Cracking Test**

J. Rule and B. Alexandrov, The Ohio State University

**3:00 PM****Evaluation of Stress Relief Cracking Susceptibility in Low Alloy Creep Resistant Steels**

C. Sarich, The Ohio State University

**3:20 PM****Hot Ductility Behavior of Selective Laser Melted 304L Stainless Steel**

D. Gonzales and S. Liu, Colorado School of Mines; D. Javernick, Los Alamos National Laboratory

**3:40 PM****Development of a New Weldability Test to Analyze Hydrogen-Induced Cracking Susceptibility in Resistance Spot Welds**

M. Duffey, AK Steel Research

**4:00 PM****Sulfide Stress Cracking Behavior of F22/625 and 8630/625 Dissimilar Metal Welds**

T. Dai and J. Lippold, The Ohio State University

**4:20 PM****Effect of Parameters on Susceptibility of Liquefaction Cracking of Al Alloys during Refilled Friction Stir Spot Welding**

T. Yuan, W. Gong, and S. Chen, Beijing University of Technology

**4:40 PM****Validation of Predictive Formula for the Development of Type 410 Stainless Steel for Hydro-processing Applications**

B. Lawson and B. Alexandrov, The Ohio State University

**WEDNESDAY, NOVEMBER 7****SESSION 7: PLENARY SESSION**

Session Chair: Y. M. Zhang, University of Kentucky

**8:00 AM****Plenary: Welding Research in Australia**

J. Norrish, UOW

**8:45 AM****John Elmer as a Scientist and Engineer**

T. Eagar, MIT

**SESSION 8: HIGH ENERGY DENSITY PROCESSES**

Session Chair: W. Tan, University of Utah

**9:40 AM****Considerations for Transitioning Electron Beam Welds to Equivalent Laser Beam Welds**

A. Black, A. Duffield, G. Swank, P. Burgardt, and B. Preston, Los Alamos National Laboratory

**10:00 AM****Weld Metal Composition and Solidification Mode Evolution during Laser Rewelding of Type 304L Alloys**

J. Berger and J. Rodelas, Sandia National Laboratories; A. Ramirez, The Ohio State University

**10:20 AM****Laser Welding of Multi-Cell Battery Packs**

D. Susan, Da. Tung, J. Rodelas, and H. Pham, Sandia National Laboratories; P. Gorman, Retired, Sandia National Laboratories

**10:40 AM****Multi-Physics Modeling of Laser Keyhole Welding of Dissimilar Metals**

W. Tan, University of Utah

**11:00 AM****Numerical Simulation on Competitive Growth of Columnar Crystal During Solidification Process of Al-Li Alloy Laser Welding**

X. Zhan, L. Xia, Y. Kang, and H. Yu, Nanjing University of Aeronautics & Astronautics

**11:20 AM****Welding Soft Magnetic FeCoV Alloy Hipercro® 50A**

D. Tung, J. Rodelas, M. Maguire, and D. Susan, Sandia National Laboratories

**11:40 AM****Laser Coupling Efficiency of Stainless Steel**

XC Hawk and S. Liu, Colorado School of Mines; B. Simonds, National Institute of Standards and Technology; D. Javernick, Los Alamos National Laboratory

**SESSION 9: HONORARY SYMPOSIUM FOR DR. JOHN ELMER - CONTRIBUTIONS TO THE WELDING METALLURGY OF STAINLESS STEELS**

Session Chair: S. Kou, University of Wisconsin

**9:40 AM****Welding Metallurgy of Stainless Steels**

J. Elmer, Lawrence Livermore National Laboratory

**10:20 AM****Dislocation Induced Long-Range Internal Stresses in Plastically Deformed Single-Phase Metals**

M. Kassner, University of Southern California

**11:00 AM****Microstructure Evolution and Solidification Cracking Susceptibility of Austenitic Stainless Steel Welds**

S. Kou, University of Wisconsin-Madison



## PROFESSIONAL PROGRAM

### SESSION 10: ARC WELDING

Session Chair: W. J. Zhang, Gestamp

#### 9:40 AM

##### **Determining Allowable Hydrogen Contamination to Avoid Porosity in Aluminum Weld Metal**

A. Barraza, C. Cross, and J. Martinez, Los Alamos National Laboratory

#### 10:00 AM

##### **Double-Sided Pulsed Laser Driven Metal Transfer in GMAW**

Y. Jia, S. Chen, and J. Xiao, Beijing University of Technology

#### 10:20 AM

##### **Mass Transport in Deposited Cold Wire Arc Cladding Process**

F. Hejripour, D. Valentine, and D. Aidun, Clarkson University

#### 10:40 AM

##### **Relating Weld Wire Surface Contamination to Porosity in GMA Aluminum Welds**

A. Barraza, C. Cross, and J. Martinez, Los Alamos National Laboratory

#### 11:00 AM

##### **Rotating-Tungsten Narrow-Gap GTAW for Thick Plates**

C. Jia, Q. Yan, B. Wei, and C Wu, Shandong University

#### 11:20 AM

##### **Effect of Si, Ti, and W on Microstructure of Iron-Based Slag-Free Self-Shielded Flux-Cored Wire**

D. Liu, Jiangsu University of Science and Technology, University of Alberta, and Zhengzhou Research Institute of Mechanical Engineering Co., Ltd.; L Li, University of Alberta; M Wu and P Wei, Jiangsu University of Science and Technology; W. Long, Zhengzhou Research Institute of Mechanical Engineering Co., Ltd.

#### 11:40 AM

##### **Reflection Pattern and Weld Penetration in GTAW**

J.S. Chen and Y.M. Zhang, University of Kentucky; and Z. Feng, Oak Ridge National Laboratory

### SESSION 11: APPLIED TECHNOLOGY

Session Chair: J. Ramirez, Air Products

#### 1:00 PM

##### **Total Weld Quality Management System - Big Data Turned into Action**

J. Noruk, Servo Robot Corp

#### 1:20 PM

##### **Low Hydrogen Welding Filler Metals for Pipelines**

R. Fuchs, voestalpine Bohler Welding

#### 1:40 PM

##### **Impact of Exoskeletons on Welding Safety, Quality, and Productivity**

T. Butler, Lean Steps Consulting, Inc.

#### 2:00 PM

##### **DeltaPoint Manifold with Water Extraction Technology (WET)**

P. Hackett, Universal Flow Monitors

#### 2:20 PM

##### **A New Twist to Financial Payback for a Robotic Welding System Robotics System Integration, Cost Justification**

Z. Michael, Yaskawa America Inc.

#### 2:40 PM

##### **Timelines in Field Welding Drive Need for Versatile and Portable Products**

A. Pfaller, Miller Electric Manufacturing LLC



**3:00 PM****How To Keep Stainless... 100% Stainless**

R. Sauders, voestalpine Bohler Welding USA, Inc.

**3:20 PM****Efficient Capturing and Extraction of Welding Fumes**

J. Zullo, Keller USA, Inc.

**4:00 PM****Automated 2D/3D Sensing for Remote Laser Welding Applications**

T. Bautze, Blackbird Robotersysteme GmbH

**4:20 PM****Improve Productivity by Welding with AC Pulse on Thin Aluminum**

M. Klee, Lincoln Electric Company of Canada

**4:40 PM****Rebuilding America**

R. Blythe, Georgia Trade School

**SESSION 12: HONORARY SYMPOSIUM FOR DR. JOHN ELMER - CONTRIBUTIONS TO ADVANCED IN-SITU CHARACTERIZATION**

Session Chair: G. Wood, Apollo Machine &amp; Welding Ltd

**2:00 PM****Contributions of John Elmer**

T. DebRoy, The Pennsylvania State University

**2:40 PM****Low-Temperature Diffusion Bonding - A Novel Approach for Joining of Challenging Materials**

P. Mayr, Technische Universitat Chemnitz

**3:20 PM****Mapping Residual Stress in Dissimilar Metal Welds using Neutron**

J. Bunn, C. Fancher, A. Payzant, D. Aidun, and R. Minneci, Oak Ridge National Laboratory

**4:00 PM****Experimental Characterization and Modeling of Heat-Affected Zone Softening in Resistance Spot Welded Advanced High-strength Steels**

Y. Lu, M. Kimchi, and W. Zhang, The Ohio State University; T. Abke, Honda R&amp;D Americas, Inc.

**SESSION 13: MODELING AND NUMERICAL ANALYSIS II**

Session Chair: A. Ramirez, The Ohio State University

**1:00 PM****A CalPhaD-Based Strategy for Modelling Microstructure during Build and Post-build Heat Treatments of Additively Manufactured Parts**

G. Faria and A. Ramirez, Dept. of Materials Science and Eng. - The Ohio State University

**1:20 PM****Modeling and Advanced Characterization of Nickel Base Alloys for Nuclear Propulsion Applications**

A. Fraser and J. DuPont, Lehigh University

**1:40 PM****Non-equilibrium Melting Model of Wires in Laser-Assisted AC Inter-wire Indirect Arc Welding**

L. Wang, Hebei University of Science and Technology; S. Chen and J. Xiao, Beijing University of Technology

**2:00 PM****Scaling of Heat and Mass Flow in Marangoni-Driven Weld Pools**

D. Havrylov and P. Mendez, Canadian Centre for Welding and Joining

**2:20 PM****Scaling, Asymptotics, and Blending of the Gaussian Moving Heat Source**

Y. Lu and P. Mendez, University of Alberta

**2:40 PM****Study and Optimization against the Gravity Effect on Variable Polarity Plasma Arc Horizontal Weldings**

Z. Yan, Beijing University of Technology

**3:00 PM****Thermo-Mechanical Effects of Non-Ideal Geometry in Circumferential Joints**

M. Grams and P. Mendez, Canadian Centre for Welding and Joining, University of Alberta

**3:20 PM****Numerical Analysis of Weld Undercut Formation during High Speed GMAW**

J. Chen, R. Zong, and C. Wu, Shandong University

**3:40 PM****Welding Metallurgy and Weldability of High-Temperature HEA System AlCoCrCuFeNi**

A. Martin and C. Fink, The Ohio State University

**4:00 PM****Exploring CO<sub>2</sub> Rapid Cooling Process for Residual Stress/Distortion Reduction in Dissimilar Metal Welds**

H. Eisazadeh, County College of Morris; A. Payzant, P. Cornwell, and J. Bunn, Oak Ridge National Laboratory; J. Goldak, Carleton University; D. Aidun, Clarkson University

**4:20 PM****Design, Fabrication, and Characterization of Graded Transition Joints**

J. DuPont, Lehigh University; J. Galler, Pratt &amp; Whitney

## THURSDAY, NOVEMBER 8

### SESSION 14: WELDING METALLURGY AND WELDABILITY STUDIES

Session Chair: W. Tang, Oak Ridge National Laboratory

#### 8:00 AM

**Kinetics and Microstructural Aspects of the Isothermal Decomposition of Austenite in a P92 Steel**

A. Hintze Cesaro, Canadian Centre for Welding and Joining; M. Luppo and C. Danon, National Commission of Atomic Energy

#### 8:20 AM

**Metallic Bump Assisted Resistance Spot Welding (MBarSW) of Dissimilar Materials: Part I: Printing of Metallic Bump**

G. Zhang, Y. Li, and Z. Lin, School of Mechanical Engineering, Shanghai Jiao Tong University

#### 8:40 AM

**Metallic Bump Assisted Resistance Spot Welding (MBarSW) of AA6061-T6 and Bare DP590: Part II: Joining Mechanism and Joint Property**

G. Zhang, Y. Li, and Z. Lin, School of Mechanical Engineering, Shanghai Jiao Tong University

#### 9:00 AM

**Microstructure Evolution and Solidification Cracking Susceptibility of Austenitic Stainless Steel Welds**

P. Yu, J. McCarthy and S. Kou, University of Wisconsin; K. Thompson, Thermo Fisher Scientific

#### 9:20 AM

**Temper Bead Welding**

J. Stewart, The Ohio State University

#### 9:40 AM

**Thermal Faceting in Austenitic Weld Metal During Multipass Welding**

S. Luther and B. Alexandrov, The Ohio State University

#### 10:00 AM

**Practical Considerations Required for Proper Fabrication & Repair Welding of Duplex and Superduplex Stainless**

J. Stoll, voestalpine Bohler Welding USA, Inc.

### SESSION 15: HONORARY SYMPOSIUM FOR DR. JOHN ELMER - CONTRIBUTIONS TO HIGH ENERGY DENSITY WELDING

Session Chair: To Be Announced

#### 8:00 AM

**The Effect of Different Environments, such as Reduced Pressure or a Change on Shielding Gas, on Keyhole Porosity and Weld Geometry in Titanium, Nickel, and Stainless Steel**

H. Carlton, J. Elmer, and J. Vaja, Lawrence Livermore National Laboratory

#### 8:40 AM

**Beam Characterization and Defect Formation in High Energy Density Welding**

T. Palmer, Pennsylvania State University

#### 9:20 AM

**Characterization of High Energy Beams for Materials Processing within the U.S. Department of Energy: Invention, Innovation and Application**

J. Milewski, Los Alamos National Laboratory

#### 10:00 AM

**Advances in Micro Welding by Laser or Electron Power Beams in Vacuum**

M. Muecke, FOCUS GmbH

#### 10:40 AM

**Tribute to John Elmer**

M. Maguire, Sandia National Laboratories

### SESSION 16: CLADDING AND DISSIMILAR JOINING

Session Chair: G. Wood, Apollo-Clad Laser Cladding

#### 8:00 AM

**Modelling Bead Geometry in Coaxial Laser Cladding Using a Fiber Laser for Nickel Tungsten Carbide Overlays**

G. Wood and D. Hamre, Apollo-Clad Laser Cladding

#### 8:20 AM

**Evaluation of Low-Cycle Fatigue Resistance at Elevated Temperatures of External Weld Repairs in Coke Drums**

S. Romo and A. Ramirez, The Ohio State University

#### 8:40 AM

**Low Current Cladding of Inconel 625 Alloy**

B. Silwal, Georgia Southern University

#### 9:00 AM

**Characterization and Testing of Low Alloy Steel Girth Welds on Internally Clad X65 Pipes**

A. Alvarez and B. Alexandrov, The Ohio State University

#### 9:20 AM

**Relationship between Heat Input, Microstructures and Mechanical Behavior of Aluminum-Stainless Steel TIG Braze Welding Joint**

H. He and P. Mendez, University of Alberta

#### 9:40 AM

**Modelling of Mixing and Unmixed Zone in 410 Stainless Steel/Inco 718 Dissimilar Metal Welds**

F. Hejripour, D. Valentine, and D. Aidun, Clarkson University

#### 10:00 AM

**Thermal Spray Cladding Optimization for Steel Drill Pipes**

W. Ott, S. Liu, and Z. Yu, Colorado School of Mines; H. Nguyen and J. Scott, Devasco International, Inc.

**AWS POSTER SESSION**

The AWS Poster Session is an integral part of the AWS Professional Program. Graphic displays of technical achievements are presented for close, first-hand examination in the Poster Session.

Posters present welding results and related material, are best communicated visually, as well as research results that call for close study of photomicrographs, tables, systems architecture, or other illustrative materials.

**EDUCATION SESSIONS****TUESDAY, NOVEMBER 6 -  
WEDNESDAY, NOVEMBER 7****W28: NATIONAL CENTER FOR  
WELDING EDUCATION AND TRAINING,  
WELD-ED & AWS EDUCATION SERVICES**

The National Center for Welding Education & Training (Weld-Ed) is open to secondary, post

secondary, and industry instructors/faculty/trainers. Weld-Ed is a dynamic partnership between industry, community and technical colleges, universities, the American Welding Society, and government with a mission to improve the quality and quantity of welding technicians to meet ongoing workforce needs.

**AWS SOCIETY EVENTS****MONDAY, NOVEMBER 5**

*All of the AWS programs on Monday, November 5 take place at the AWS Headquarters Hotel, Hilton Atlanta, Grand Ballroom.*

**7:00 AM - 8:30 AM****W29: AWS PRAYER BREAKFAST**

This year's speaker at the AWS Prayer Breakfast will be Mr. Scott Funderburk, Director of Global Product Management, for ESAB Welding and Cutting. The Prayer Breakfast will be held in Rooms 204/205 at the Hilton.

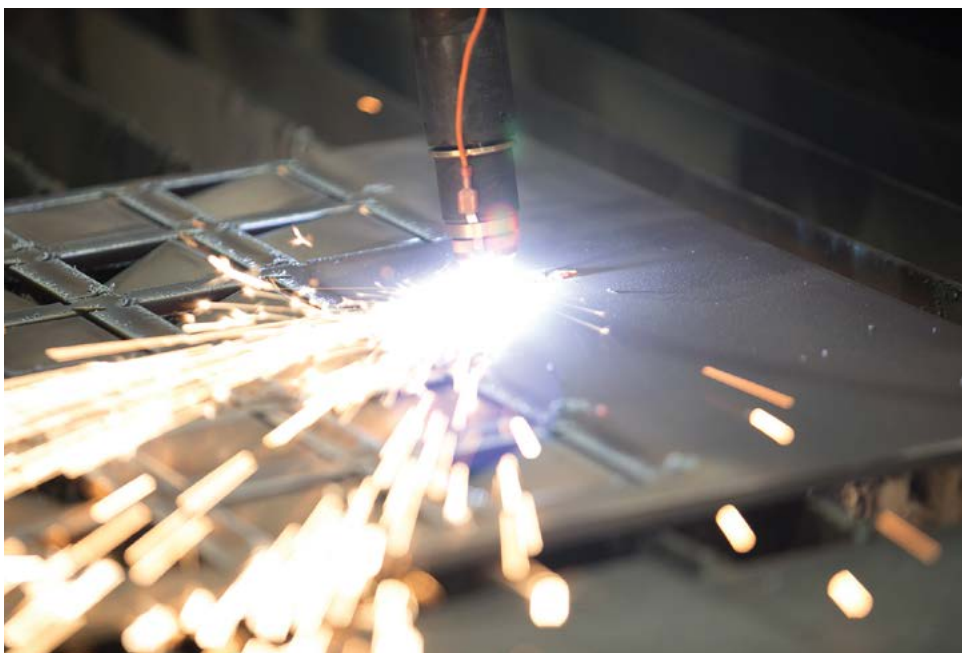
**9:00 AM - 10:00 AM****AWS OPENING SESSION**

During the AWS Opening Session and the 99th Annual Business Meeting, 2018 AWS President

Dale Flood will give the Presidential Report and Thomas J. Lienert, PhD, will be inducted as the AWS President for 2019. Following the induction, the 2018 Class of AWS Counselors and Fellows will be introduced. This meeting is open to all AWS Members and show registrants.

**10:30 AM - 11:30 AM****COMFORT A. ADAMS LECTURE**

The Comfort A. Adams lecture this year is titled "Science-Based Approaches to Repair Welding Technology for Dissimilar Welded Joints in Nuclear Power Plants" by Kazutoshi Nishimoto. Kazutoshi Nishimoto is a Fellow of the International Institute of Welding and an honorable member of the Japan Welding Society, JWS.



**6:30 PM – 9:00 PM****AWS OPENING RECEPTION**

On behalf of the AWS President and First Lady, we invite you to attend the AWS Opening Reception. This reception is the official kickoff to FABTECH 2018 for AWS members. Attendees will have the opportunity to shake hands with our AWS Officers and CEO, as well as network with AWS members from across the globe. Drink tickets will be provided to all reception attendees.

**TUESDAY, NOVEMBER 6****12:00 PM – 2:00 PM****AWS AWARDS/AWS FOUNDATION LUNCHEON**

Join an assembly of distinguished award presenters, recipients, and guests for a well-paced ceremony and a delicious lunch. The cost for attending the ceremony is \$30 and is open to all registrants.

**2:00 PM – 3:00 PM****AWS NATIONAL NOMINATING COMMITTEE - OPEN MEETING**

AWS Members are requested to submit their recommendations for National Officers to serve during 2020. Nominations must be accompanied by 20 copies of biographical material on each candidate, including a written statement by the candidate as to his/her willingness and ability to serve if nominated and elected.

**WEDNESDAY, NOVEMBER 7****10:00 AM****R.D. THOMAS, JR. INTERNATIONAL LECTURE**

This year's Lecture will feature Jérôme Dietsch. Mr. Dietsch serves in the Information Department as Standardization Officer at Institute de Soudure, for the French Welding Institute.

**10:30 AM (immediately following the R.D. Thomas, Jr. International Lecture)****AMERICAN COUNCIL OF IIW**

American Council of the IIW is the meeting of the U.S. member body of the International Institute of Welding.

**12:00 PM – 2:00 PM****AWS EXCELLENCE IN WELDING AWARDS CEREMONY AND LUNCHEON**

By invitation only.

# DESTINATION ATLANTA

Atlanta sits at the intersection of Southern charm, creativity and sophistication. From arts and culture to music and cuisine, the city offers something for everyone to enjoy. Around every corner is a new attraction, award-winning restaurant or neighborhood gem to explore.

## Get the Best Hotel Selection and Savings

Book your stay through onPeak, FABTECH's Official Hotel Provider, for guaranteed lowest rates and big benefits — including complimentary shuttle service, hotel parking and no booking or service fees!



**Reserve your rooms early for the best selection and price — hotels sell out quickly.**

[fabtechexpo.com/accommodations](http://fabtechexpo.com/accommodations)

## Start Planning Now!

Download the FABTECH app to access show info on the go — exhibits, floor plans, sessions, agenda planner and more — at [fabtechexpo.com/mobile-app](http://fabtechexpo.com/mobile-app).



Mobile App Sponsored By:



# GLOBAL STRENGTH.

LOCALIZED  
MANUFACTURING

AMADA is committed to the engineering and manufacturing of the world's most precise and productive machine tools. Our most popular series of laser machines and advanced automation systems are manufactured in California — providing localized manufacturing to meet the specific design needs of North American fabricators.

Laser cutting systems currently being manufactured in California include the ENSIS Series and the LCG Series. AMADA's ENSIS Fiber Laser technology provides continuous processing of thin-to-thick materials without requiring a lens change or additional setup. The LCG Series combines optimal power and cutting speed to efficiently process a wide variety of material types and thicknesses.

Automation systems range from shuttle tables to the innovative AMS CL — a modular system that allows fabricators to seamlessly transition from a single cycle loader to a multi-shelf tower that can support multiple lasers.

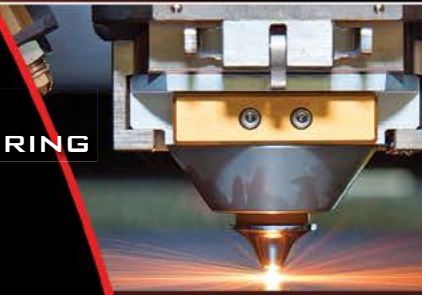
AMADA understands the distinct challenges today's manufacturers face. That's why we provide a complete line of laser cutting systems that range from 3kW to 9kW. No other company is better positioned to provide you with the optimal machine tool solutions needed to successfully compete.



Laser Manufacturing Facility in Brea, CA



**AMADA's global network of manufacturing bases includes facilities in North America, Europe, China and Japan.**



*The ENSIS Series is available in 3015 and 4020 models and can be configured with CL automation options to best suit your specific manufacturing needs.*



*The LCG Series is also available in 3015 and 4020 models and can be configured with CL automation options to best suit your specific manufacturing needs. (Shown with AMS 3015 CL Cycle Loader)*

 **FABTECH**

**Visit AMADA at Booth B6909**



**AMADA AMERICA, INC.**

180 Amada Court • Schaumburg, IL 60173  
[www.amada.com/america](http://www.amada.com/america)

**877-262-3287**

Fabricators & Manufacturers Association, Intl.<sup>®</sup>  
2135 Point Blvd | Elgin, Illinois 60123 USA



# FABTECH

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

**NOVEMBER 6 - 8**

Georgia World Congress Center  
Atlanta, Georgia



**REGISTER TODAY at [fabtechexpo.com](http://fabtechexpo.com)**

Complimentary admission to the exhibits! Use the Promo Code next to your address when registering online.