# **2015 ADVANCE PROGRAM**







Ask questions, get answers and find new trends to increase productivity and your bottom line.



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

NOVEMBER 9-12, 2015 | MCCORMICK PLACE | CHICAGO

#### **INSIDE:**

- Exhibitor List
- Special Events
- Schedule-at-a-Glance
- Education Programs
- Hotel & Travel
- Planning Tools

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# YOU ARE INVITED TO JOIN US INDUSTRY NIGHT AT LUCKY STRIKE

#### GET READY FOR AN UNFORGETTABLE NIGHT OF NETWORKING AND FUN!

- Strike up a game of bowling or billiards with industry players.
- Eat, drink and enjoy some of local Chicago's favorite foods.
- Experience one of downtown Chicago's best entertainment venues.



Advance tickets for FABTECH attendees available now! fabtechexpo.com/industrynight

Advance ticket price is \$50 and includes bowling, entertainment, food and drinks.

# METAL MAKES LIFE MORE: productive

As an industry, the products we make improve daily life — providing safety, convenience, comfort, energy and so much more. At FABTECH 2015, you'll get full access to the people, processes and solutions needed to make it all possible and profitable. Make plans today to discover the resources for improving your bottom line.

#### **WORLD-CLASS EXHIBITS**

#### **Advance Your Career, Grow Your Business.**

FABTECH fosters the exchange of ideas and innovation for growth-focused products and services. Talk to the technical experts and learn what's new – and what's next.

#### **EDUCATION PROGRAM**

#### Gain Valuable Insight From Real-World Visionaries And Your Peers.

Best-in-class educational and training programs targeting technical, operational, lean manufacturing, economic, and managerial segments to up your game and your confidence.

#### **NETWORKING OPPORTUNITIES**

#### Collaborate With Colleagues And Potential Partners, Face-To-Face.

40,000+ like-minded metal industry professionals gathered to address challenges, share trends, discuss best practices, enhance job skills and uncover innovations.



form knowledge

fabricate solutions

**weld** relationships

finish strong

General Information3-4
Exhibitor List 5-8
Special Events10-11
Keynote Presentation: Running a Winning Organization 10
Additive Manufacturing / 3D Printing10
Enterprise Security Risks: Is Your Company Protected?10
Women of FABTECH Breakfast 11
Keynote Presentation: Innovation and the Future of Work in Advanced Manufacturing11

State of the Industry Executive Outlook11 Professional Welding
Competition11
Education Program12
Event Pricing14
Schedule-at-a-Glance 15-18
Finishing Track 19-24
Stamping Track 24-27
Lasers & Cutting Track 27-30
Lean Track 31-33
Management Track 33-37
Additive Manufacturing Track37-38

Job Shop Solutions Track	38-40
Automation Track	40-42
Forming & Fabricating Track	42-44
Tube & Pipe Track	45
Welding	46-61
Seminars	46-48
Conferences	48-50
RWMA Resistance	
Welding School	51
Professional Programs	51-57
Educational Sessions	58-60
Special Programs	60-61
Hotel & Travel	62

# FABTECH 2015 IS GOING TO BE BIGGER THAN EVER!

More Technology. More Halls. More Opportunity.

FABTECH is where deals are made and serious business gets done, around-the-clock. Make side-by-side product comparisons and uncover new ideas and solutions all while saving valuable time and money.

- 1,500+ exhibiting companies
- 650,000+ net square feet of floor space
- 40,000+ attendees
- 100+ education sessions, including content for every role
- Inspiring keynote speakers
- All industry networking event



#### START PLANNING NOW!

Download the FABTECH app to access show info on the go — exhibits, a floor plan, sessions, agenda planner and more — at fabtechexpo.com/mobile-app.





#### Find Products and Solutions in the Following Technology Categories

Additive Manufacturing/ 3D Printing Arc Welding Assembly

Bending & Forming Brazing & Soldering Business Services Coil Processing

Cutting

Fastening & Joining Finishing/Paint & Powder Coating

& Powder Coating Finishing/Plating

Gases & Gas Equipment

Hydroforming

Inspection & Testing
Job Shop/Contract Mfg.

Lasers Lubrication

Maintenance & Repair

Material Handling Metal Suppliers

Plate & Structural Fabricating

Press Brakes Punching

Resistance Welding

**Robotics** 

Safety & Environmental

Saws

Software, Machine Controls

Stamping

Thermal Spraying

Tool & Die

Toolina

Tube & Pipe Fabricating

or Welding

Tube & Pipe Producing

Wateriet

Welding Consumables

Welding Machines

#### **Show Location**

McCormick Place 2301 S. Martin Luther King Dr. Chicago, IL 60616 mccormickplace.com

#### **How to Register**

Register today online at fabtechexpo.com. Or, download a printer-friendly registration form from the Web site and fax to (508) 743-9696.

#### **Show Hours**

Monday, Nov. 9 — 10:00 AM – 6:00 PM Tuesday, Nov. 10 — 9:00 AM – 5:00 PM Wednesday, Nov. 11 — 9:00 AM – 5:00 PM Thursday, Nov. 12 — 9:00 AM – 3:00 PM

#### **Show Admission**

Exhibit-only attendance is FREE through November 6, 2015. Beginning November 7, the cost to attend the exhibits is \$50. AWS, FMA, SME, PMA and CCAI members may always attend the exhibits for FREE with a valid member card.

#### MEET WITH EXHIBITING COMPANIES SHOWCASING **HUNDREDS OF PRODUCTS AND SOLUTIONS!**

Exhibitor list by pavilion as of 08-03-2015. Visit fabtechexpo.com for a complete exhibitor list.

#### FINISHING & COATING

Abrasive Products & Equipment ACT Test Panels LLC ADF Systems Ltd Adhesive Systems Inc Advanced Energy AFC Finishing Systems AkzoNobel Powder Coatings American Finishing Resources American Grinders Inc Amiberica Inc Anest Iwata USA Inc APFI International Argon Masking Corp Assured Testing Services ATS Applied Tech Systems LLC Axalta Coating Systems AZZ Galvanizing Services Baril Coatings USA BASF Corp Bavco / Guspro Inc Bel Air Finishing Supply Bex Spray Nozzles Blast Cleaning Technologies Blastman Robotics Ltd Bronco Blast Equipment Bulk Chemicals Inc Caldan Conveyor A/S Calico Coatings Calvary Industries Inc Caplugs Castrol Industrial North America Inc Cataforesis SA de CV Catalytic Combustion Co Catalytic Industrial Systems Cefla North Ámerica CFCM Canadian Finishing & Coatings Manufacturing Chameleon Innovations Chemco Manufacturing Company Inc Chemetall US Inc Chemical Coaters Assoc Int'l Chemico ChemQuest Inc Clean Àir Technology Solutions Clemco Industries Corp Col-Met Engineered Finishing Solutions Columbus Industries Inc Combustion and Systems Inc Conforming Matrix Corp Coral Chemical Co Crest Industrial Chemicals Inc Custom Fabricating & Supplies Daifuku North America Datapaq Inc DeFelsko Corp Dinamec Systems DuBois Chémicals DuPont Teflon Industrial Coatings Duroair Technologies Inc Dynabrade Inc Echo Engineering Eisenmann Corp Elcometer Inc Electrocoat Association.The ElektroPhysik USA Inc Elevance Renewable

FINISHING & COATING Empire Abrasive Equipment Empowering Technologies Enhancement Technologies / Sublitex-Miroglio EPSI (Engineered Products & Services Inc) Ervin Industries Everest Elektromekanik Makine Ve Sistemleri San Ve Tic Ltd Sti EXEL North America Express Chem LLC Filter 1 Finishing Brands Fischer Technology Inc Fostoria Process Fauinment Gema USA Inc General Automatic General Fabrications Corp George Koch Sons LLC Gibson Abrasive Equipment LLC Global Finishing Solutions Gostol TST d.d. Graco Inc Hedson Technologies Inc Henkel Corp Hentzen Coatings Inc Heraeus Noblelight LLC Herr Industrial Inc. Houghton International Inc Hubbard-Hall Inc IFS Coatings Inc IHC Inc Intek Corporation IntelliFinishing INTERTEK Iowa Waste Reduction Center IST International Surface Technologies Keyence Corp Of America Keyland Polymer Ltd KMI Systems Inc. Koch Filter Corporation Kolene Corporation LDPI Inc LPI Inc LPR Global Inc Magic Rack/ Production Plus Corp Main Tape Metal Coaters/ Metal Prep MetoKote Corp Midwest Finishing Systems Mighty Hook Inc MPC Plating Munters Corp NikoTrack II C Nordson Corp Northern Coatings & Chemical Northrop Grumman Orient Corporation of America Oshorn Oshkosh Finishing Services

FINISHING & COATING PEM Inc Pneu-Mech Systems PoliFilm America Pollution Control Products Co. Porcelain Enamel Institute Inc Powder Coating Powder Parts Inc PPG Industries Inc Precious Plate Inc. Precision Quincy Ovens LLC Proceco Ltd Products Finishing Magazine Prona Tools Inc Protech Powder Coatings Rapid Engineering Reading Technologies Inc Reliant Finishing Systems Rhodes Systems International Inc Richards-Wilcox Inc Rohner Ruwac Safety-Kleen/Ecopower Sata Spray Equipment Selas Heat Technology Sherwin Williams Shop Floor Automations Inc sia Abrasives Inc USA SIT Brushes Southern Systems Inc Sponge-Jet Inc Spray Systems Inc Spray Tech/Junair Stoelting LLC Suhner Industrial Products Inc. Sunkiss Matherm Radiation Superfici America Inc System Technologies Tanis Inc TCI Powder Coatings TekVisions Inc The Blast Shop Inc The Powder Coating Institute Therma-Tron-X Inc TIGER Drylac USA Inc Top Cat Air Tools TQC-USA Inc Transmet Corp Trimac Industrial Systems Uni-Spray Systems Inc United Industries Inc. Valmont Coatings Vapor Technologies Venjakob North Am/Nutro Inc, Member of Venjakob Maschinenbau GmbH & Co KG VitaFlex LLC

Vitracoat America Inc

Vogel Industrial

Coatings VULKAN Blast Shot

Wagner Systems Inc Walther Pilot North

Whiting Corporation

Wisconsin Oven Corp

America LLC

Webb-Stiles Co

**FORMING &** 

Abas USA

Abtex Corp

**FABRICATING** 

3rd Dimension Industrial 3D Printing

Accurpress America Inc

Parker Ionics

Patriot Metal

Paul Gardner Co

Finishing Systems Inc

#### FORMING & FABRICATING AccuStream Inc

Aeromet Industries Inc

Ajan Elektronik Servis Sanayi Ve Ticaret Ltd St

Alliance For American Manufacturing

Alliance Machine and

Acieta

Acrotech Inc

AKS Cutting Systems Inc

Alfra USA LLC

Akyapak

Engraving LLC Alliance Steel LLC Allied Machine & Engineering Corp Alma CAM USA LLC Alternative Parts Inc AM Machinery Sales Inc Amada America Inc Amada Machine Tools America Inc Amada Miyachi America Ambrell Induction Heating Solutions American Manufacturing Inc American Photonics American Punch Co AMS Controls Inc ANDRITZ Herr-Voss Stamco Inc Anhui Lianmeng Mould Industrial Co Ltd Apex Machine Group ARKU Coil Systems Inc Armstrong Kover Kwick Inc ARNTZ Inc Arro-Mark Co LLC Arrowhead Manufacturers & Fabricators Assoc ASKO Inc Athader Autodesk Inc Automec Inc AVFVA Inc Bad Dog Tools Baileigh Industrial Inc Barton International Baykal Makine A.S. Beck Automation Beckhoff Automation Behringer Saws Inc Beka-Mak Makina Sanayi Ve Ticaret AS Betenbender Manufacturing Inc Big Steel Rack Biztiks Blanking Without Dies Blastec Inc Blue Chip Engineered Products Inc Boldrini srl Bollhoff Attexor SA BONENG Transmission USA LLC Bosch Rexroth Corp Boschert Precision Machinery Inc Bowlin Manufacturing Inc Rox On Demand Bradbury Co Inc Bradbury Group Australia Bradbury Group Pu.Ma. Bradbury Group, The Braner USA Inc BROBO / Ken Bergman & Assoc LLC BTM Saws Burghardt + Schmidt GmbH

## FORMING & FABRICATING

CMF

Elmaksan Makina

Burr King Manufacturing Co VE Ticaret Ltd Sti Bushman Equipment Elumatec North America Inc Butech Bliss Emmegi USA Inc BUWW Coverings Inc. Bystronic Inc. C Marshall Fabrication Epilog Laser Corp Machinery Ergotech Inc Cagle Industrial Maintenance FRIF7 Ermaksan Mak. San ve Tic. AS Cambco Inc Camlock Systems ESCO Tool Co Carell Corporation Euroboor BV Centricut Eurolink Inc CH Steel Solutions Inc Everite Champion Cutting Tool Corp Fab Supply Inc Fabricating & Metalworking Magazine Chemtool Inc Cidan Machinery Inc Fabricators & Cincinnati Inc Manufacturers Association Cincinnati Inc -BAAM Exhibit FabSuite - Steel Cleveland Punch & Die Co FabTrol Systems Inc Cleveland Steel Tool Co Fascut Industries CMS North America Inc COB Industries Inc COE Press Equipment Felton Inc FF Journal/ Modern Metals Coherent Inc Ficep Corporation Coldwater Machine Co Fiessler Flektronik COLE-TUVE Inc Gmbh & Co KG Combilift USA FIMI Spa COMEQ Inc FIPA Inc Comesa Srl Fisher Unitech CONCOA Inc Fladder-Hansen Control Laser Corp & Hundebol Inc Controlled Automation Inc FlashCut CNC Flexarm Inc Cordstrap USA Inc Cornerstone Capital Partners Cosen Saws Flowdrill Inc Fluke Corporation FomUSA Costa Sanders LLC Formdrill USA Inc Cowles Tool Co Formtek Inc CR Cuscinetti A Rulli Srl Framo Morat Inc Creaform FSInspection CTD Machines Fujitsu Glovia Inc. Current Inc Full Vision Inc Custom Rollforming Corp Galaxie Corporation Cy Laser SrL Gasparini SpA Gauer Metal Products Inc D&H Machinery Inc Daito USA Inc GE Mathis Co Dake Corporation General Wire Form Dalmec Inc GMA Garnet USA Corp Darex LLC data M Sheet Metal Gorbel Inc Solutions GmbH GPI Prototype & DAVI Inc Manufacturing DCM Tech Inc Services Inc Design Data Gravotech Inc Design Storage & Handling Inc GrishamWorks LLC GSM America Inc Design-2-Part Guild International Dimeco Alipresse Gutsun Die Casting Co Ltd Divel Inc DoALL Sawing Products H2O JET Inc Donaldson Torit -Donaldson Company Inc Doral Equipment Rental Haco-Atlantic Inc Doringer Cold Saws Haeger Inc DOT Quality Services Dr Gold & Co. Hafendorfer Machine Inc Dr Shrink Inc Dreistern Inc. Durma LISA Dynatect Manufacturing Inc Co. Ltd Eastern Metal Supply Eberle America Inc Fconco/CPI Co. Limited Edwards Manufacturing Co EHRT / International Technologies Inc

### FORMING & FABRICATING

Elmali Makina Sanayi Enutron International Management Software FARO Technologies Inc Flow International Corp HABERLE / Ken Bergman & Assoc LLC Haeusler AG Duggingen Hangzhou Xiangsheng Abrasive Machine Manufacturing Han's Laser / Gromax Enterprises Corp Han's Laser Technology Hans Weber Sales and Service Corp Hascelik San VE TIC AS Hayes International HF&M Saw Inc.

**FORMING & FABRICATING** Heck Industries Hexagon Metrology Inc HG Farley Laser Lab USA Inc HGG Profiling Equipment BV Hidrotam Machinery Hifly Mould Téchnology Co Ltd Himalaya Machinery Pvt Ltd Hiwin Corporation HK Laser & Systems Hougen Manufacturing Inc Huagong (Dalian) Innovation Technology Co Ltd Hvd-Mech Group Ltd Hypertherm Inc II-VI Infrared IMC Marks LLC Imperial Systems Inc Indiana Economic Development Corp Inductaflex Itd Industrial Machine Trader Industrial Magnetics Inc Industrial Market Place Industrial Molded Rubber Products InfoSight Corp Inspectech Analygas Group Inc Integrous Steel Software Solutions International Knife & Saw Inc International Technologies Inc IQMS ISB Iturrospe / ITUX IVEC® SYSTEMS J&J Bar Plus JDSU JET Jet Edge IFTCAM-NestONE Solutions JHP Fasteners Inc Jiangsu Tanyua Welding & Cutting Machinery Co LTD Jilin Province Yuanlongda Industrial Machinery Co Ltd IK Lasers IMR Industrial IMT USA JobBOSS Jobscope ERP Joemars Machinery & Electric Industrial Co LTD Johnson Bros Metal Forming Co Johnson Thermal Systems Inc Jordi Universa V.S.L. JR Automation Technologies KAAST Machine Tools Inc Kalamazoo Machine Tool Kalamazoo Metal Muncher Kar Metal San Ve Tic LTD STI Kasto Inc Kayahan IC VE DIS TIC A.S. Keller USA Inc Kennedy Mfg Kern Laser Systems Ketec Precision Tooling Inc. KeyedIn Manufacturing Software Solutions Kinetic Cutting Systems Inc

**FORMING &** FABRICATING KMT Waterjet Systems Inc KNÚTH Machine Tools USA Inc KoCos America LLC Komatsu America Industries LLC Koyo Giken Inc Kunshan Eagle Precision Tooling Co Ltd Kunshan Shinfung Tooling Co Ltd Lantek Sheet Metal Solutions Lapham-Hickey Steel Laser Experts Inc Laser Marking Technologies/ LMT Group Laser Mechanisms Inc Laser Research Optics Lazer Safe Pty Ltd LENOX Liang Rong Machinery Co Ltd Lincoln Flectric Co. Lissmac Corp LT Ultra Precision Optics LVD Strippit Lyon Industries Machine Concepts Inc Makita Industrial Tools Manufacturing Solutions Maguinas Herramientas Bimex Marcovil Stoelting Marion Die & Fixture Inc Marlin Steel Wire Products Marvel Manufacturing Co Masteel America Corp Master Induction Heat Treat Master Roll Manufacturing Mate Precision Tooling Mazak Optonics Corp MB Metal Technologies MC Machinery Systems Inc Measurement Systems Intl a Rice Lake Weighing Systems Brand Mecco Marking & Traceability MegaFab-Piranha-Whitney-Bertsch Messer Cutting Systems Metal Supermarkets Service Company Inc MetalFinish LLC MetalForming Inc Metalix CAD/CAM Ltd MetalMizer MetaMation Inc Metform International Ltd MetIsaw Systems Inc Metreel Inc MG S.r.I Micro-Surface Finishing Products Midwest Automation Midwest Tool Inc MIE Solutions Inc Millerbernd Mfg Company Millner Haufen Tool Company Mittler Bros Machine & Tool Modern Manufacturing Technologies Intl MTA-USA LLC Muller - Load

Containment Solutions

Murata Machinery USA Inc

Reliantt Co Ltd

MultiCam Inc

Nantong

**FORMING &** FABRICATING National Sheet Metal Machines Inc Nehraska Public Power District Ningbo Langyi Metal Products Co LTD Nitto Denko America Inc Nitto Kohki USA Inc nLIGHT Corp Noritake Co Inc Norlok Technology Inc North American Safety Products Inc. Oasis Scientific Inc O'Brien Installations Ltd Ocean Machinery Inc Ohio Laser LLC OMAX Corp. OmegaCube Technologies Oncor Ophir Optics LLC OSALUSA Oxford Instruments Ozhavrak Protection Technology Pacific Press Technologies Packsize International LLC Pangborn Corporation Pannier Corp Parker Hannifin Pat Mooney Inc Peddinghaus Corp PEP Technology Perfection Global LLC Permadur Industries Inc Peter Prinzing GmbH Phillips Saw & Tool Inc Phoenix Metals Co. Photonics Spectra & Industrial Photonics Polyurethane Products Corp Precision Saws Inc Preco Inc Press Brake Safety Solutions Prestigé Equipment Corporation Presto Lifts Inc Prima Power North America Inc Prodevco Industries Inc Production Tube Cutting Inc Proiect Tool & Die Inc Qnect Inc Quanzhou Tengda Fine Casting Co Ltd Ouarld Ltd Lianyungang Radan RAS Systems LLC Red Bud Industries Retro Systems LLC Rhino Ćutting Systems Richardson Flectronics Ltd. Rigidized Metals Corp Rocklin Manufacturing Co Roll Forming Corp Rolled Alloys Roller Die + Forming Co Rosler Metal Finishing USA LLC Rousseau Metal Inc SafanDarley BV Salvagnini Ámerica Inc Samco Machinery Ltd Sawblade.com SB Whistler & Sons Inc SBFM Makine San Tic Ltd Sti Scantool Schelling America Inc Schneider Electric

Scotchman Industries Inc

Sealeze A Unit of Jason Inc

Service Lamp Corp

Semyx LLC

Sertom SpA

Wang Tung Engineering LTD

Weil Engineering

North America

Wemo International B V

#### **FORMING &** FABRICATING

Servo Products Shaoxing Inbon Machinery Co LTD Shenzhen Wing Kam Machinery Co Ltd Shijiazhuang Ropa Import & Export Co. Ltd Shop Data Systems Inc Shoptech Software Shopvox SIC Marking USA Inc SICK Inc SidePlate Systems Inc Sideros Engineering SigmaTEK Systems LLC SMF Soitaab USA Inc Solar Atmospheres Soph Magnetics SPANCO Inc Stainless Structurals LLC STAM SpA Starcyl Cylinders State of Wyoming Steel Craft Technologies Steel Storage Systems Inc Stor-Loc Corp Stratasys Inc Striker Systems StruMIS LLC Sugar Steel Corp SUNS International LLC Superior Joining Technologies Inc SuperMax Tools Supra Machine Tool Syspro Tab Wrapper Tornado Tapeswitch Corporation T-DRILL Team Oregon Advanced Manufacturing TEC Laser Tech CNC LTDA Techflex Inc TECHNI Waterjet Techniks Inc Tekla Inc Tengzhou Tri-Union Machinery Co Ltd TeraDiode Inc The Extractor The FABRICATOR The M K Morse Company The RDI Group Thermal Care Thermal Dynamics TigerStop ĹLC Timesavers LLC Today's Industrial Products & Solutions Toolmen Corp Toskar Machinery Trilogy Machinery Inc TRUMPF Inc Tsune America LLC Tube Works Inc Turkish Machinery TYKMA Technologies Tyrolit Industrial Abrasives UniPunch Products Inc United Global Sourcing Inc Unittool Punch & Die Ursviken Inc US Industrial Machinery Co V&S Galvanizing LLĆ Vatan Makina San Ve Tic As Vidir Machine Inc Virtek Vision International VKS - Visual Knowledge Share Voortman Corporation VvTek Walker Magnetics

#### FORMING & FABRICATING

West Virginia Development Office Wheelahrator Group Wila USA Williams Metals and Welding Alloys Inc Wilson Tool International Wisconsin Metal Parts Inc Workshops For Warriors World Economic Development Alliance Worthington Industries Wuxi SQS Electrical Xcalibur XRF Services Yangli Yangzhou Metalforming Machine Tool Co Ltd Yarde Metals Inc YESTOOL / Aloris USA Zhejiang Jinggong Science & Technology Co LTD Zipp Air Tool Company ZMac Transportation Solutions

7und America Inc METALFORM 3D Systems, CimatronE AAF International ABC Metals Inc ACB - CYRIL BATH Accurate Die Design Inc/Logopress3 Accurl Admiral Steel LLC Agathon Machine Tools Inc AIDA-America Corp Airloc Alcos Machinery Inc Alliance Manufacturing Inc Allor Manfacturing Inc/ Plesh Industries Alma Machinery Co Almco Inc Almetals Co Alro Steel Corporation Amstek Metal Anchor Danly Anchor Manufacturing Group Inc ANSYS Inc AP&T North America Inc Appleton Manufacturing Div Aqualified Arisa S. A ART Technologies Inc ASC Machine Tools Inc. Ashland Aluminum Co Associated Spring RAYMOND Atlatl Software AutoForm Engineering USA Inc Automated Tapping Systems Automatic Feed Company Bachman Machine Co Balluff Inc Batesville Tool & Die Inc Beckwood Press Co. Benteler Maschinenbau Gmbh Bestar LLC BesTech Tool Corp Biele S A Big Ass Solutions Bihler of America Inc Bilz Vibration Technology Inc Black Hills Corporation Bohler Uddeholm Corp Brave Control Solutions Inc Brown Boggs Machine Co Ltd Bruderer Machinery Inc

Bunting Magnetics Co

Christy Metals

METALFORM CHS Automation CIECO Inc Clayton Metals Cleveland Metal Exchange Inc Clips & Clamps Industries Closed Loop Recycling COE Press Equipment Cogistix LLC Colt Automation LTD Cometel S A Dalian Leading Metal Ltd Dallas Industries Inc Daubert Cromwell DAYTON Lamina Corporation DELTA Computer Systems Inc Delta Industrial DESCH Canada Ltd Diehl Steel Co Inc Digital Lumens Doerfer Companies TDS Automation/ Wright Industries Dongguan A-one Metal Co Ltd Dongguan Changhong Metal Technology Co LTD Dongguan Qiangfa Metal Co Ltd Dongguan SYH Tooling Co Ltd Dongying Haihe Machinery Co Ltd DTC Products Corporation Durable Superior Casters Dvnamatic Eagle Brass Co EAGLE Certification

Group Eagle Press & Equipment Co Ltd EAS Mold & Die Change Systems Inc Easley Enterprises LLC (EELLC) Ebner Furnaces Inc FCi M1 Fhrhardt Tool &

Machine Electrex Industrial Solutions Elizabeth Carbide Components Engineering Technology Associates Inc Enprotech Industrial Technologies

Epicor Software Corporation Erickson Metals Corp Etna Products Inc F & G Tool and Die Co Fab Shop Magazine Direct Fagor Arrasate Feed Lease Corp Fibro Inc

FluidForming Americas Fontijne Formitt Inc Fontiine Grotnes Inc Forming Technologies Inc FORMITALY FORMTEK-ME Fortech Products Inc Fuchs Lubricants Co GEORG

Global Metal Spinning Solutions Inc - DENN USA Metal Forming Goessling USA Inc Goff Inc Gowin Checking Fixture Manufacturer Co Ltd Graitec Inc Green Valley Manufacturing Inc Greenerd Press &

Machine Company Inc

KKŤ chillers

Klingelhofer Corp

METALFORM Gruber Tool & Die Inc Guanghe Industry (Hong Kong) Co. Ltd Hangsterfer's Laboratories Inc Helm Instrument Co Inc Henan Golden Sun Foundry Co Ltd Hilma Div Carr Lane Roemheld Hip Yick Industrial Co Ltd Hitachi Metals America Houghton International Inc HTM Sensors Hutchison Tool Sales Co HYSON Metal Forming Solutions IHI Ionbond Inc IMSM Inc Industrial Innovations Inc Industrial Machinery Digest Intercomp Interlaken Technology International Chemical Co Irmco Inc ISGEC Heavy Engineering Ltd Jarvis Cutting Tools Inc JIER North America JIT Automation Inc J-Tech Kaeser Compressors Inc Kent Corp Kodima Co Ltd Kolev Engineering Inc Komatsu America Industries LLC Kosmek USA Kyzen Corporation Lapeyre Stair Inc Larson Tool & Stamping Lasercoil Technologies LLC Latrobe Specialty Steel Distribution Lauffer GmbH & Co KG Lee Contracting Inc Leifeld Metal Spinning AG Lenzkes Clamping Tools Inc Linear Transfer Automation Inc Link Electric & Safety Liuzhou Shangtai Lianzhong Die Co Ltd Logopress3/ Accurate Die Design Inc LSP Industries Inc Macrodyne Technologies Inc Manitowoc Tool & Manufacturing LLC Master Magnetics Mavfran International Inc MDS Fastening Systems Meccanica Rossi Metalloid Corp MetalRustGuard Midwest Manufacturing News MJC Engineering & Technology Inc Moeller Precision Tool Multipress Inc Nadella Inc National Kwikmetal Service Neff Press Inc Netherlands Consulate General NGK Metals Corp Nidec Minster Corn ODM Tool & Manufacturing Co Inc Oerlikon Balzers Coating USA Inc OGS Industries OMCG North America OMCO Oriental Casting Inc Oriimec Corporation of America Orttech Inc Otto Bihler Maschinenfabrik Gmbh & Co Ozkoc Hidrolik Makina San Ve Tic A2 P&G Fluid Power Inc

#### **METALFORM**

P/A Industries Inc Pacesetter Systems Paper-Less LLC Paulo Products Co Pax Machine Works Inc Pax Products Inc Penn United Technologies Inc PennEngineering Peterson Spring Philpott Rubber/ Lankhorst Mouldings Plex Systems Pneumatic Innovations LLC Polmont GmbH Polymet - a unit of Precision Engineered Products Porter Precision Products Pottiez America LP Power Breezer Precision Metalforming Association Precision Punch Corp Precision Stamping Products Premier Tooling & Mfg Inc Prescor LLC Press Room Equipment Co Pressroom Electronics Inc Prime Controls Pronic Inc Pure Metal Recycling Quintus Technologies LLC R&M Manufacturing Co LLC Raffin Construction Co Rapid-Air Corp Rapidrill LLC Raziol Zibulla & Sohn GmbH Ready Technology Inc Rock Valley Oil & Chemical Co Inc Roland Industrial Electronics LP Rolled Metal Products Ross Controls **RUF Briquetting Systems** Samson Roll Formed Products Co Samuel Strapping Systems Sander Automation Corp Sangiacomo Presses Americas LLC SB Specialty Metals LLC Scheffer Krantechnik Gmbh Schmale Machinery USA LLC Schuler Incorporated SelfLube Serapid Inc SEYI America Inc Shenzhen Manyes Precision Metal Co Ltd Shenzhen Meinie Tool & Die Co Ltd Shop Edge Software Inc Simpac Inc SKF USA Inc Sourcing Allies North America Southern Machinery Repair Inc Southwestern Industries Inc Special Springs LLC Spectro Analytical Instruments Spectrum Ind. E-Coat Div. Spyraflo Inc Stainless Sales Corp StampingSimulation.com Pty Ltd Stamtec Inc Starrett Company Steel King Industries Inc Steinel Normalien Ag Stripmatic Products Inc Strothmann Machines & Handling GmbH Superior Die Set Corp Superior Roll Forming Sutherland Presses SWH Precision / Formtechnic Taiwan Mold Tool Co Ltd TCT Stainless Steel Tecnomagnete Inc The Heim Group The Right Corner of Texas Toledo Blank

Toledo Integrated Systems

Toptime Precision Electronics Co Ltd

**METALFORM** TopYes Precision Metal Products Co LTD Torque Inc Torque Technologies Inc Torspec International Inc Tower Oil & Technology Co Trans-Matic Travelers Insurance Inc Triform Sheet Hydroforming U.S. Tsubaki/Kabelschlepp Uelner Precision Tools & Dies Ulbrich Stainless Steels & Special Metals Inc Ultrasonic LLC Unisorb Installation Technologies Unist Inc United Aluminum Corp United Performance Metals Van-Am Tool & Engineering Inc Vaughn Manufacturing Co Versatility Professional Tool Storage Vibro Dynamics Corp Victory Tool Viking Blast & Wash Systems Vista Metals Inc Voith Turbo Inc Waukesha Metal Products Wieland Metals Inc Wilco Inc Wilson Tool International Wintriss Controls Wysong Xinyongxu Metal & Die (shenzhen) Co Ltd xTuple-World's #1 Open Source ERP Xuyi Titan & Material Co Ltd Yamada Dobby Co Ltd Yida Mould Co Ltd Yong Da Precision Mould (Dong Guan) Co Ltd Yong Ju Machinery Co Ltd Yuyao Jingqiao Harware Factory Zapp Precision Strip Zerust Corrosion Solutions Zhijia Tool & Die Corp TUBE & PIPE

5 Star Engineering and Maintenance Accurex Measurement Inc Addison Machine Engineering Inc AddisonMcKee / Eaton Leonard Advanced Fabricating Machinery Advanced Tubular Technologies Inc Ajax Tocco Magnethermic Corp Alpine Bender Machinery AltaMAR Inc Ampco Metal Inc Asia Machine Group ASMAG USA Inc Atlanta Drive Systems Inc Beveltools BLM GROUP USA Corp Brandt Engineered Products Ltd Carbinite Metal Coatings Chicago Pneumatic Tool Co Chiyoda Kogyo-Maruka USA Clark Fixture Technologies Clings Aerospace Combilift USA Comco USA Inc Continental Pipe & Tube Cut-Off Machines Crippa SPA Current Tech
Design Storage &
Handling Inc
DE-STA-CO
Douglass Mfg LLC
Eddytech Systems Inc EFD Induction Inc eldec LLC EnvisionTEC Inc

Ercolina - CML USA Inc

Tools for Bending

Tube & Pipe Technology

Tube Form Solutions

Tube 2016 Messe Dusseldorf North America

Tube Bending Concepts Inc

Tubex Technology Machinery

Universal Controls Group Universal Tool & Engineering Universal Tube & Rollform Equipment Corp

WAFIOS Machinery Corp

Waterjet USA LLC

Watts Specialties Inc

Tru-Cut Saw Inc

**TUBE & PIPE** Exact Metrology Exact Pipe Tools Inc Fastenal Company FD Machinery Co Ltd Fives Bronx Inc Fromm Packaging Systems G.B.C. Industrial Tools S.p.A. Gem Tool Corporation George A Mitchell Co Global Precision Parts Inc. Graebener Reika Inc Haven Manufacturing Corp Horn Machine Tools Inc Huth - Ben Pearson International LLC Hydrotube Enterprises Inc Ihara Science USA Innerspec Technologies Innovative Tube Equipment Corp INNOVO Corp Intercon Enterprises Inc J & S Machine Inc Jenoptik Laser Technologies LLC Keep the Heat Kent Corp Lillbacka USA LORD Corporation Magnetic Analysis Corp Mair Research SpA Manchester Tool & Die Inc Metalloid Corp Metronor Inc Michigan Pneumatic Tool Inc MiiC Ămerica Inc Mill Masters Mille Miglia Engineering srl MSI NBM Metals NDT Technologies Inc New Fire Co Ltd New Form Tools Ltd Numalliance Inc Olimpia 80 S R L OMNI-X USA Overton Industries Passline Performance Pat Mooney Inc Patterson Fan Co PAVE CNC Wire Forming Systems Ltd PEE WEE GmbH PHI Pines Engineering Proto-1 Manufacturing Quaker Chemical Corp Quantum Machinery Group R&B Machining Inc Rafter Equipment Corp Rattunde Corporation REA Elektronik Inc Reika GmbH & Co KG Rhodius RIDGID Rigaku Corp Roll Machining Technologies & Solutions Sage Automation Inc Sanderson Machines Ltd Schwarze-Robitec GmbH Sharpe Products SST Forming Roll Inc T&H Lemont Tenryu America Thermatool Corp Thermo Scientific

**TUBE & PIPE** 

Wauseon Machine & Manufacturing Inc Wecotech AG

Winton Machine Company WELDING ABB Inc-Robotics ABICOR BINZEL Above Material Technology Co. Limited ABRAX SRI Ace Industrial Products AGT Robotics Aimtek Inc Air Products Air Purification Inc Airflow Systems Inc Airgas Inc Alabama Laser Alabama Robotics Technology Pk Allcryo ALM Positioners Inc American Society For Nondestructive Testing American Technical Publishers American Torch Tip Co Inc American Welding Society American Weldguip Inc American Wire Research AMET Inc Andersen Industries Inc Anthony Welded Products Inc Antra Téchnologies Co Ltd Aquasol Corp ARC Holdings Inc Arc Machines Inc Arc Specialties Inc ARCBRO ARCON Welding Equipment LLC ArcOne Armor Tool Arrow Castings Ltd Associated Technologies Weld Mount ATI Industrial Automation Auburn Manufacturing Inc Avani Environmental Intl Inc AVS Industries LLC Axelent Inc Azarbod Software B&B Pipe & Industrial Tool Baoding Co-Better Cutting Tools Co Ltd Baoding Lanyu Welding Material Co Ltd Bay State Surface Technologies Beijing Essen Welding & Cutting Fair Beijing Metals & Minerals Corp Bellman-Melcor LLC BESSEY Tools North America Blackbird Robotics North America Bluco Corp Bonal Technologies Inc Bore Repair Systems Inc Borkim Welding Technology BP Automation Bradford Derustit Corp Broad Industrial Group Ltd Broco Rankin RTIC America Corporation Buffalo Shrink Wrap BUG-O Systems Inc Bullard C & G Systems C H Symington & Co Inc Cadi Co Inc Cambridge Vacuum Engineering Capital Weld Cleaners Carr Lane Manufacturing Co CEIA USA Cerbaco Ltd CGW-Camel Grinding

Wheels USA

WELDING Changzhou City Yunhe Welding Material Co Ltd Changzhou Huarui Welding & Cutting Equip Co Ltd Changzhou Huatong Welding Industry Co Ltd

Changzhou Longren Mechanical & Electrical Co Ltd Changzhou Shine Science & Technology Co Ltd

Changzhou Wow International Trade Co Ltd Changzhou Wujin

Golden Globe Welding & Cutting Machinery Co Ltd Changzhou Zhengyang Welding Material Co Ltd Chart Inc China FAW Group

Chung I Silver Solder Co Ltd Cibo nv CK Worldwide Clamp-Rite Clamptek

Enterprise Co. Ltd Clara Vision Cloos Robotic Welding Inc CM Industries Inc Cold Jet

Computers Unlimited Continental Carbonic Products COR-MET INC Cougartron CribMaster

CS United Inc. Cuda Tools Inc. Cyl-Tec Inc D/F Machine Specialties Inc Dakota Ultrasonics Dalian Lianhe Precision

Sheet Metal Co. ITD Dalian Orient Metal Co Ltd

Dataweld Inc Dengensha America Corp DEWALT Power Tools

and Accessories Diagraph MSP an ITW Company Diamond Ground Products Inc.

Diamond Saw Works Inc DIG Automation Engineering (WUHAN) Co Itd Dimplex Thermal Solutions

Dino-Lite Scopes (BigC) Dinse Inc Direct Wire & Cable DiversiTech DualDraw LLC

DURUM USA Dynatorch Inc E. H. Wachs Eisele Connectors Inc

**ELCo Enterprises** Elcometer Inc Electron Beam Technologies Inc Element Materials

Technology EnergynTech Inc Ensitech Fauinois LLC ESAB Welding &

Cutting Products Essen Trade Shows ESTA Apparatebau Gmbh & Co KG **Evolution Power** Tools LLC

Jingyu Welding &

John Tillman Co.

JP Nissen Co

Kalas Wire Inc

Tools GmbH

útting Co Ľtd

JLC Electromet Pvt LLC

Jovsun Abrasives Co Ltd

Karnasch Professional

Factory Cat FANDELI Coated Abrasives FANUC America Corp

WELDING Farina (Jinan) Weldtec & Machinery Co Ltd Fein Power Tools Inc Flame Technologies Inc Flange Wizard Tools Flexovit USA Inc Focus GmbH Focus Technology USA Inc Forney Industries Inc Froniús USA LLC Fusion Inc G&J Hall Tools Inc Ganzhou Hongfei Tungsten & Molybdenum Materials Co LTD Gasflux Co GE Schmidt Inc Genesis Systems Group Genstar Technologies Inc GH Induction Group Goff's Enterprises Inc Goldland Industrial Goodweld Corp Goss Inc Gudel Inc Gullco International H & M Pipe Beveling Machine Co Inc H & S Tool Inc Harbert's Products Inc/ Allied Flux Reclaiming Ltd HBS Studwelding Inc Helvi S.p.A Hermes Abrasives Ltd Heron Machine & Electric Industrial Ltd Hisco Hohart Brothers Hobart Institute of Welding Technology HOSO Metal Co Ltd Hotfoil EHS Inc Hsin Fu Chia Industrial Co Ltd Hydromist IBEDA /Superflash Compressed Gas Equipment Inc Ideal Welding Systems LP IGM Robotic Systems Inc. igus Inc II-VI HIGHYAG In.Motion Technology Distribution Industrial Air Solutions Inc/CORAL spa Industrial Solutions & Innovation LLC In-House Solutions Inc Innovative Product Ideas LLC Interactive Safety Products Inc International Welding Technologies Inc InterTest Inc IPG Photonics IRCO Automation Inc Ironworkers
Management
Progressive Action
Cooperative Trust
(IMPACT) ITW Pro Brands JASIC Technologies America Inc Jiangsu Guotai International Group Guomao Co Ltd Jiangxi UNICO Abrasive Tech Co Ltd Jiangyin Xinlian Welding Equipment Co Ltd

WELDING Kawasaki Robotics (USA) Inc Kayo Products Co LTD Keystone Fastening Technologies Kistler Machines Kiswel USA Inc Klimawent USA LLC KLINGSPOR Abrasives Inc Kobelco Welding of America Inc Koike Aronson Inc Koolant Koolers KUKA Robotics Corporation Laboratory Testing Inc LA-CO Industries/ Markal Laizhou Hongyuan Bench Vise
Manufacture Co I td Laserline Inc Lasermet Inc LaserStar Technologies Corp Laservision Lianyungang Orientcraft Abrasives Co Ltd Liburdi Dimetrics Corporation/Liburdi Automation Inc Lin An Da Yang Welding Material Co Ltd Lincoln Electric Co Linemaster Switch Corp LONGEVITY Global Inc LORS Machinery LS Industries Inc LSN Diffusion LTD Lucas-Milhaunt Global Brazing Solutions Luvata Ohio Inc Machinery Dealers National Assoc Magnatech LLC Manwo Manufacturing Sdn Bhd Marathon Sales Inc. Maryland Brush Co Matchless Metal Polish Co Matheson Mathey Dearman Matsumoto U.S. Technologies Inc McDantim Inc MCR Safety MedMassager.com Meltric Corp MeltTools LLC MENNEKES Electrical Products Mercer Abrasives Meridian Laboratory Inc Meta Vision Systems Inc. Metabo Corp Metal Man Gear Co Metal Technologies & Mgmt Inc Micro Air Products Midalloy Miller Electric Mfg Co Missouri Welding Institute Mitec Welding Equipment (Shenzhen) Co Ltd MK Products Inc Morris Engineering Works Ltd

Motofil Robotics SA

MTI Power Services

Multi-Contact USA

Nation Wide Products

National Ornamental

Nelson Stud Welding Inc

Welding Wire and Metal Products Co Ltd

Newface Protective

Newland (Tianjin)

National Standard

Nederman LLC

NetBraze LLC

Coltd

Motoyuki Co. Ltd

Movex Inc

WELDING Ningbo Kimpin Industrial Pte Ltd Ningbo Powerway Alloy Material Co Ltd Nondestructive Testing Institute (NDTI) Nordfab Ducting Norton | Saint-Gobain NSRW Nutfield Technology Nutron Nameplate Inc Oerlikon Metco (US) Inc Olympus Optrel Inc. OR Lasertechnology Inc ORS Nasco Osborn OTC Daihen - Mobile Solution Center OTC DAIHEN Inc Otto Trading Inc Oxylance Inc Pador Marketing Group Pandjiris Inc Parker domnick hunter Parweld Ltd PDS Bartech Inc Pearl Ahrasive Co. Pemamek Oy Ltd PFERD INC Phoenix International Inc Pillar Induction Pine Zone (Quanzhou) Abrasives Industry Co Ltd Plasma Automation Inc /Vicon Machinery LLC

plasmo Industrietechnik GmbH Polymet Corp PowerWeld

Praxair Inc Praxair Surface Technologies Precitec Inc Preston-Eastin Inc Pro Spot International

Production Design Services PROFAX / LENCO Pro-Fusion Technologies PROTEM USA LLC Proton Onsite PTG Heavy Industries Ltd

PT-Mat PTR-Precision Technologies Inc PushCorp Inc Pyro Shield Inc Qingdao New Alpha Enterprises Co Ltd

Qingdao Qingflex Hose Factory Radyne Corp Rasco FR Ratermann Mfg Inc Realityworks Red Rock Automation

Reis Robotics USA Inc Resistance Welding Machine & Accessory Revco Industries Inc Rex-Cut Abrasives

RF System Lab RIMCO Rotator Rite Hite Machine Guarding Robotmaster Robots At Work RoboVent

Rofin-Sinar Inc RoMan Manufacturing Inc rose plastic USA LLLP Ruko Tool Inc

RWMA - Resistance Welding Manufacturing Alliance Saar-Hartmetall LISA LLC Saf-T-Cart Inc.

Saint-Gohain Foams & Tapes Sakura of America

WELDING Sandvik Materials Technology SanRex Corp Saru Silver Alloy Private Limited Save Phace Inc Schaefer Ventilation Equipment Sellstrom Manufacturing Co Servo-Robot Inc Shandong Huaye Tungsten & Molybdenum Co Ltd Shandong Yanggu Jingyanggang Precision Casting

Shanghai Gas Welding Equipment Co Ltd Shanghai HI-ZONE Welding Equipment Manufacture Co Ltd Shaviv USA SIAT SpA

Signature Plates Inc SKC Engineering Ltd SKM Industries Inc Smartware Group SMC Corp Of America SMK Co Ltd Song Rui Industries USA

Copper & Supply
Southern Stud Weld Inc Special Metals Welding Products Co Staubli Corp Steelmax Tools SteelTailor Ltd

Southern

Steiner Industries STOBER Drives Stor-Loc Corp Strong Hand Tools Strong Hold Products Sturbridge

Metallurgical Services Sumig USA Corporation Sumner Manufacturing Co Inc Sunstone Engineering

Superior Products SYI Industrial Co Ltd Synetik Design Taylor Winfield Technologies Inc Team Industries Inc TEC Welding Products Technical Translation Services

Techniweld Technogenia Inc Tecknoweld Alloys (overseas) Private Limited

TECMEN Electronics Co Ltd Tec-Spiral Enterprises Co Ltd Terralux The Walter A

Wood Supply Co Thermco Instrument Corp Thermion Inc Tianjin Xinsen Welding Materials Co Ltd Tip Tig USA LLC Titus Flux Reclaiming

TJ Snow Co Trendex Inc Tri Tool Inc Tricor Alloys Tri-Mer Corp Triple Crown Products TRU-FIT Products TRU-Weld

Trystar Inc TŚE Safety Inc TSG North America LLC TWI North American LLC Ultraflex Power Technologies Corp

U-Mark Inc

WELDING Uniarc Limited United Abrasives Inc /SAIT Uniweld Products Inc Uratech Tooling Technologies Inc VDM Metals USA LLC Veroine LLC Victory Plasma Systems Vitronic Machine Vision VJ Technologies Inc voestalpine Bohler Welding USA Inc VSM Abrasives Corp Walter Surface Technologies Washington Alloy Co Weiler Corporation Weld Engineering Co Weld Mold Co

Weld Systems Integrators Inc Weld-Aid Products Weldas Co LLC Weldcoa Welder Training & Testing Institute

Welding Alloys USA Welding Productivity Magazine Weldlogic Inc Weldobot Ltd Weldsale LLC Weldship Corp Welker Engineered Products

Wendt USA LLC Wenzhou Essen Security Technology Co Ltd WESPRO Power Tools/ TAP-RITE Tapping Systems

West Chester Protective Gear Western Enterprises Winnox Industries Ltd WireCrafters Inc Wisconsin Wire Works Inc Wise Welding

Technology & Equipment Co Ltd WITT Gas Controls Wolf Robotics LLC Wrefs Welding LLC Wuhan Welhel Photoelectric Co Ltd Wuxi Longteng Welding

and Cutting Equipment Co Ltd Wuxi Ronniewell Machinery Equipment Co Ltd

Wuxi Welcut Technology Co Ltd Wuxi Yincheng Science & Technology Co Ltd Wuxi Zhouxiang Complete Set of Welding Equipment Co Ltd Xiris Automation Inc

Yaskawa America Inc York Portable Machine Tools Zhejiang Changzheng Project Carbon Electrodes Co Ltd Zhejiang Huajing Réctifier Co Ltd Zhejiang Lissam Welding Equipment

Coltd Zhejiang Yuguang Aluminium Material Co Ltd Zhengzhou Anxin Abrasives 7henazhou

Chuanwang Welding Consumables Co Ltd Zibo Maike Welding Equipment Co Ltd ZJ Industries Inc

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#### SPECIAL EVENTS FREE AND OPEN TO ALL ATTENDEES

#### MONDAY, NOVEMBER 9

#### **KEYNOTE PRESENTATION**

#### **Running a Winning Organization**

Speaker: Rusty Wallace

Time: 9:00 – 10:00 AM | Location: Ballroom S100

NASCAR legend and champion Rusty Wallace places a focus on the fact that teamwork is pivotal to winning. Although you may drive solo, without the support of a pit crew and team, success is always more difficult to achieve. From the men and women in the crew to the final lap and finish line, Wallace demonstrates that anything is possible through the power of teamwork.



#### **FEATURED PRESENTATION: EXPERT PANEL**

#### What Additive Manufacturing/

#### 3-D Printing Means for the Metal Fabrication Industry

Time: 12:30 – 1:30 PM | Location: FABTECH Theater, Grand Concourse

Additive Manufacturing is experiencing change and growth, but how can this innovation help improve your business? Business leaders in the Additive Manufacturing industry will discuss where we are in this technology and where it is going. What are the new challenges? How should a company invest in the technology? How does this new type of manufacturing change the way that we do business? Attendees can gain perspectives into this technology in terms of making metal parts and how the continued evolution of technology and pricing structure affect high-mix, low-volume manufacturers as well as reducing the cost of complex part production for metal manufacturers.

Moderator: Kevin Ayers, Industry Manager, Additive Manufacturing & 3-D Technology, SME

Panel: Carl Dekker, President, Met-L-Flo, Inc.

**Bob Markley**, CEO, 3rd Dimension Industrial 3D Printing **Rick Neff**, Manager of Market Development, Cincinnati Inc. **Bryan Crutchfield**, Managing Director, Materialise USA

#### **TUESDAY, NOVEMBER 10**

#### FEATURED PRESENTATION: EXPERT PANEL

#### **Enterprise Security Risks: Is Your Company Protected?**

Time: 12:30 - 1:30 PM | Location: FABTECH Theater, Grand Concourse

Smart Manufacturing, Industrial Internet, Industry 4.0, and Advanced Manufacturing; what do they have in common? The threat of enterprise security breaches and compromises has become one of business' greatest — and most unpredictable — risk factors. An increasing number of companies are falling victim to internal and external threats, and the manufacturing industry is no exception. This session offers a comprehensive look at the current threats manufacturers face, the security vulnerabilities they exploit, and the potential impact on an organization. Attendees will receive critical information and guidance on developing a security strategy that deploys the latest and greatest technologies available to protect a company's valuable information and minimize disruption to customers, operations and productivity.

Moderator: Jay Monahan, SAP Director, Global Shop Floor, Dell

Panel: Dr. Dong Wei, Cybersecurity Research Scientist, Siemens Corporate Research

**Dominick Glavach**, CISO and Principal IS Security Engineer, Concurrent Technologies Corp.

Jay Conolly, Director, Commercial Solutions, Prescient Edge, LLC

#### WEDNESDAY, NOVEMBER 11

#### Women of FABTECH Breakfast with Tech Tour

Time: 7:30 – 10:30 AM | Location: Ballroom S100

Join us for a networking breakfast celebrating the importance of women in the manufacturing sector. This event aims to foster relationships and dialogue between supporters and practitioners in the field. Includes a continental breakfast followed by a keynote by Karen Kerr, GE Ventures, and tech tour on the show floor. Price: \$15.

#### **KEYNOTE PRESENTATION**

#### Innovation and the Future of Work in Advanced Manufacturing

Speaker: Karen Kerr, Director of Advanced Manufacturing, GE Ventures

Time: 8:30 – 9:30 AM | Location: Ballroom S100

GE is at the forefront of innovation, from changing the way we design and manufacture our products to optimizing supply chains and industrial processes. These advanced manufacturing techniques are creating faster disruptions, more flexible factories and higher-performing products, which has empowered the worker and elevated the workforce. The future of work is full of creativity and entrepreneurship, and will redefine the competitive landscape in multiple sectors, creating far-reaching implications that will reverberate through international trade patterns and the distribution of global growth. And it is affecting each of our daily lives through major advances in health care, energy, transportation, and the way we work.



#### FEATURED PRESENTATION: EXPERT PANEL State of the Industry Executive Outlook: Advanced Manufacturing

Time: 12:30 – 1:30 PM | Location: FABTECH Theater, Grand Concourse

In this session, leading manufacturers will discuss how they stay on the forefront of manufacturing technology advancements and how they deal with these disruptive technologies as it relates to new product introduction, supply chain, customer interaction, and advanced automation. Learn how successful manufacturers approach innovation through advanced manufacturing to meet customer needs and how small to medium sized job shops can enhance their own competitiveness in today's world. Walk away with new insights that will guide your business decisions for 2016 and beyond.

Moderator: Rebecca R. Taylor, Senior Vice President, National Center for Manufacturing Sciences Panel: Marni Rutkofsky, Director of Strategy and Marketing, GE Ventures

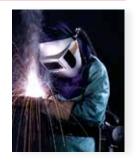
Robert Henderson, Director of Additive Manufacturing, Linear Mold & Engineering, Inc.

Tom McGaughy, Director of Technology, EWI

#### MONDAY, NOVEMBER 9 - WEDNESDAY, NOVEMBER 11

#### **Professional Welding Competition**

Time: During Show Hours | Location: Hall C1, Booth C1844 Professional welders can sign up onsite to compete for a \$2,500 first prize, a \$1,000 second prize, and a \$500 third prize. Don't miss the chance to cheer on competitors as they demonstrate their skills to earn the title of "Best Welder in America." Contestants will make a single-pass SMAW weld with E7018 on low-carbon steel. Speed and quality will be the criteria. Announcement of winners at 11:00 AM on Wednesday, November 11.



#### **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 finishing, stamping, lasers and cutting, lean, management, additive manufacturing, job shop solutions, workforce, forming and fabricating, tube and pipe and automation. All sessions are two hours in length, offering practical knowledge you can use right away. Sessions with Tech Tours combine classroom instruction followed by 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 and thermal spraying. Events include conferences, 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 programs offered at FABTECH 2015. Note that you can use the following key to find the education that meets your needs:

- **Basic** Recommended for the attendee who is new to the industry or needs a refresher on the topic.
- Intermediate Designed for the attendee who already has a basic understanding of the subject
- 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 programs may be eligible to receive 1 credit per hour attended toward their SMEmanaged recertification requirements.

#### MEMBERSHIP INFORMATION

Discounted rates for members are available on educational programs. 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 Web sites today!











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sme.org

pma.org

ccaiweb.com



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# PRICING INFORMATION

#### **Exhibits Only**

Attendance is FREE through November 6. Beginning November 7, the cost to attend the exhibits is \$50. AWS, FMA, SME, PMA, and CCAI members may always attend the exhibits for FREE with a valid member card.

#### **FABTECH Industry Night**

**Tuesday, November 10, 2015:** Tickets for FABTECH attendees are \$50\* and include bowling, entertainment, food and drinks, networking, and more at Lucky Strike Chicago. (\*Limited to first 500 tickets purchased. Price will increase to \$75.)

#### **Education Programs**

Finishing, Stamping, Lasers and Cutting, Lean, Management, Additive Manufacturing, Job Shop Solutions, Forming & Fabricating, Automation, and Tube & Pipe Tracks

	Member	Non-Member*
1 Session	\$150	\$175
2 Sessions	\$280	\$325
3 Sessions	\$375	\$445*
4 Sessions	\$475	\$545*
Full Conference: (5 or more sessions) Includes (1) \$24 lunch ticket	\$680	\$780*

Early bird rates good through Oct. 16. After this date, please add \$25.

\*Non-member rates for 3 or more sessions include a one-year complimentary membership to one of the co-sponsoring associations (FMA or SME only).

Welding Track			
	Member	Non-Member <sup>a</sup>	
1-Day AWS Educational Sessions	\$150	\$235	
2-Day AWS Educational Sessions	\$225	\$310	
1/2-Day Seminar	\$335	\$420	
1-Day Conference or Seminar	\$550	\$635	
2-Day Conference or Seminar	\$775	\$860	
2-Day RWMA Resistance Welding School	\$775	\$860	
1-Day Professional Program	\$150	\$235	
4-Day Professional Program	\$225	\$310	
Student Professional Program	\$75	\$90 <sup>b</sup>	
AWS Awards Luncheon	\$30	\$30	
AWS Prayer Breakfast	\$10	\$10	

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

CONFERENCE CANCELLATION POLICY: Cancellations must be made in writing and faxed to Attn: FABTECH Conference Cancellation at (313) 425-3407 no later than October 26, 2015 to receive a full refund minus a \$50 administrative fee. Cancellations received after this date are non-refundable. Substitutions allowed.

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

MONDAY, NOVEMBER 9			
TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3:30 PM
		C20: Conceptos Básicos de Pintura en Polvo en Español	C30: NEW! Powder Coating Basics 🗉
FINISHING		C21: NEW! Spray Booth Design: Do It Right	C31: Basics of Electrocoating
		C22: NEW! Keys to Successful Finishing: Hooks, Racks & Stripping	C32: NEW! Curing Options for Industrial Finishing Operations
STAMPING	\$10: Software Solutions for Metal Forming I	S20: Stamping Aluminum	\$30: Value Added Technology
	S11: Press Technology I 💵	S21: Press Technology II 国	S31: Press Technology III 💵
LASERS & CUTTING	F10: NEW! Advances in Laser Joining Applications I	F20: NEW! Advances in Laser Joining Applications II	F30: NEW! Laser Processing 101 🖪
LEAN	F11: Lean Principle: Strategic Planning and Organizational Alignment	F21: NEW! Lean Principle: Developing People and Processes	F31: NEW! Lean Principle: Business Strategy for Sustainability
	F12: NEW! Workforce:	F22: NEW! Workforce: New Approaches and Strategies for the Next Generation	F32: NEW! Workforce: Leadership Strategies and Tools for Managing Your Organization
MANAGEMENT	Innovation and Team Building Strategies	F23: NEW! Framework for Product Development Strategies	F33: NEW! Tech Trends: Emerging Threats, Disruptions and Opportunities in the Fabrication Industry
JOB SHOP SOLUTIONS	F14: NEW! Manufacturing Execution System (MES) Technology: Explained	F24: NEW! Cost Reduction Strategies for Job Shops	F34: NEW! Improving Your "Bottom Line" with Better Estimating, Job Costing and Scheduling
AUTOMATION	F15: NEW! Panel Discussion: Maximizing Your ERP Scheduling Tools	F25: NEW! The Connected Enterprise: Bringing the Data Together	F35: NEW! Automation Application Strategies for Product Mix
FORMING & FABRICATING	F16: Press Brake Safeguarding: Changes to ANSI B11.3	F26: Tooling Solutions for Metal Fabricators	F36: Maximizing Your Roll Forming Operation
WELDING			
SEMINARS	W10: Bridge Code Clinic		
PROFESSIONAL PROGRAM	W30: Session 1: Recent Progresses in Overlay and Cladding		
EDUCATIONAL SESSIONS	W36: National Center for Welding Education and Training, Weld-Ed 9:00 AM – 3:30 PM		
SPECIAL PROGRAMS	W38: AWS Prayer Breakfast		



TUESDAY, NOVEMBER 10			
TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3:30 PM
	C40: NEW! Getting Your Part Across	C50: NEW! Preventive Maintenance & Trouble- shooting Your Powder Coating System	C60: FINISHING Spray Painting Workshop
FINISHING	C41: NEW! The Future of Liquid Industrial Finishing	C51: Testing: Why It's Important & How to Do It Effectively	1:00 PM - 5:00 PM \$299 for members \$349 for non-members
	C42: NEW! The Secrets of Purchasing a Finishing System	C52: NEW! Old vs. New! Are You Ready for a Pretreatment Change	
STAMPING	S40: Software Solutions for Sheet Metal Forming II	S50: NEW! Advanced High-Strength Steel (AHSS) Technology I	S60: Advanced High-Strength Steel (AHSS) Technology II
	S41: Error Proofing I 🖪	S51: Error Proofing II 🔼	S61: NEW! Error Proofing III
LASERS & CUTTING	F40: NEW! Industrial Laser Beam Technology	F50: NEW! Cutting Best Practices	F60: Comparative Cutting with Tech Tour
LEAN	F41: Lean Tools: Value Stream Mapping <b>II</b>	F51: Lean Principle: Building 3D Supply Chains for Lean Management	F61: Lean Tools: Quick Changeover and TPM
MANAGEMENT			F62: Workforce: Building a Competency Based Training and Development Program
HARACENERI	F43: NEW! Risk and Asset Management: What You Need to Know!	F53: NEW! Managing for Value: Extraordinary Enterprise 🔼	F63: NEW! Growth by Making Strategic Acquisitions
ADDITIVE MANUFACTURING	F48: NEW! Additive Manufacturing Overview for Fabricators	F58: NEW! Additive Tooling Manufacturing Aids	
JOB SHOP SOLUTIONS	F44: NEW! Structural Fabrication 101	F54: Designing Parts for Sheet Metal	F64: NEW! Product Tracking for the Job Shop
FORMING & FABRICATING	F46: Press Brakes for Engineers	F56: Advancements in Coil Slitting	F66: Bending Optimization Solutions
WELDING			
SEMINARS	W16: Crash Course of WIT		
CONFERENCES	W26: So You're the New Welding Engineer – Day 1       8:00 AM –       5:00 PM         W27: Electron Beam Welding Conference – Day 1       9:00 AM –       5:00 PM         W28: Thermal Spray Basics – FREE       1:00 PM –       4:30 PM		
PROFESSIONAL PROGRAM	W31: Session 4: Dissimilar Joining       8:00 AM       12:00 PM         Session 5: Advancements in Arc Welding       8:00 AM       12:00 PM         Session 6: Testing and Characterization       (Professor John C. Lippold Symposium)       8:00 AM       11:30 AM         Session 7: Metallurgy and Weldability       2:00 PM       5:30 PM         Session 8: Advanced Sensing and Control       2:00 PM       5:30 PM         Session 9: Modeling (Professor John C. Lippold Symposium)       2:00 PM       5:00 PM		
EDUCATIONAL SESSIONS	W37: AWS Education Sessions		8:00 AM - 4:00 PM
SPECIAL PROGRAMS	Robotic Arc Welding Competit AWS Professional Welders Con Welding Wars Competition – D	ion – Day 2 npetition – Day 2 Day 2 nstration (Hourly) – Day 2	9:00 AM - 5:00 PM 9:00 AM - 5:00 PM 9:00 AM - 5:00 PM

WEDNESDAY,	NOVEMBER 11		
TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3:30 PM
	C70: NEW! Optimizing a Batch Powder Coating Operation	C80: NEW! Painting Over Hot Dip Galvanizing	C90: NEW! Powder Coating Color Change & Transfer Efficiency
FINISHING	C71: NEW! Troubleshooting for E-Coat Imperfections	C81: Efficient Curing with Infrared	C91: NEW! Getting the Most Out of Your Pretreatment
	C72: NEW! Modernizing the Abrasive Air Blast Facility with Tech Tour	C82: NEW! Safety Codes & Compliance: How Important is It?	C92: NEW! Saving Costs on Your Plating Line
STAMPING	S70: NEW! Lubrication Technology	S80: NEW! Pressroom Safety and Performance	S90: NEW! Eddy Current vs. Variable Frequency Drives Applications
LASERS & CUTTING	F70: NEW! Laser Beam and Process Monitoring	F80: NEW! Innovations in Industrial System Technology I	F90: NEW! Innovations in Industrial System Technology II
LEAN	F71: Lean Tools: Flow and Pull	F81: Lean Tools: 5S Workplace Organization and Standardization	F91: Lean Principle: Visual Workplace
MANAGEMENT	F72: NEW! Workforce: Build Accountability and Delegation Strategies for Effective Management	F82: NEW! Workforce: Managing Labor Risk and Cost	F92: NEW! Closing the Skills Gap: Demystifying Relationships Between Employers and Schools
MANAGEMENT	F73: NEW! Exit and Succession Planning for Business Owners	F83: NEW! Direct Sales or Outsourcing; Which is Better for Your Business?	F93: NEW! Marketing Strategies and Powerful Tools to Enhance Your Presence in the Market Place
JOB SHOP SOLUTIONS	F74: NEW! Structural Fabrication Technology	F84: NEW! Metallurgy 101	F94: NEW! Improving Environmental Working Conditions in the Job Shop
AUTOMATION	F75: NEW! Automating the Shop Floor	F85: NEW! Modernizing Maintenance and Inspection	
FORMING & FABRICATING	F76: NEW! Operational Press Brakes: the Four Pillars of Tonnage	F86: NEW! Improving Your Operation with Lubricants	F96: Optimizing Production of Your Punching Machine
TUBE & PIPE	F77: Tube Production II	F87: Bending Tube	F97: NEW! Testing and Inspection of Tube and Pipe
WELDING			
SEMINARS	W18: ASME Section IX, B31.1 & B31.3 Code Clinic – Day 2       8:30 AM – 4:30 PM         W19: Corrosion of Welds: Causes and Cures       1:00 PM – 5:00 PM         W20: Visual Inspection Workshop       8:30 AM – 4:30 PM         W21: Preview of the New Part B Weldments       8:30 AM – 5:30 PM         W22: Welding of Stainless Steel (Basics)       8:30 AM – 4:30 PM		
CONFERENCES	W26: So You're the New Welding Engineer – Day 2		
RWMA SCHOOL	W29: RWMA Resistance Welding School – Day 17:45 AM – 5:00 PM		
PROFESSIONAL PROGRAM	W32: Session 10: Plenary Session		
EDUCATIONAL SESSIONS	W37: AWS Education Sessions		8:00 AM - 4:00 PM
SPECIAL PROGRAMS	AWS Professional Welders Con Welding Wars Competition – [	cion – Day 3 npetition – Day 3 Day 3 nstration (Hourly) – Day 3	9:00 AM - 3:00 PM 9:00 AM - 3:00 PM

THURSDAY, NOVEMBER 12			
TECHNOLOGY	8:00 AM - 10:00 AM	10:30 AM - 12:30 PM	1:30 PM - 3:30 PM
FINISHING	C100: FINISHING Spray Painting Workshop  8:00 AM – 12:00 PM – \$299 for members \$349 for non-members		
LEAN	F101: NEW! Lean Tools for Sustainable Operations		
JOB SHOP SOLUTIONS	F104: NEW! Making a Business Case for Safety		
FORMING & FABRICATING	F106: Making Flat Parts: Leveling Solutions 🖪		
WELDING			
SEMINARS		l (Avoiding Weld Defects) eryday Welding	
RWMA SCHOOL	W29: RWMA Resistance Welding School – Day 28:00 AM – 4:30 PM		
PROFESSIONAL PROGRAM	W33: Session 16: Mechanical Properties		
SPECIAL PROGRAMS		nce Application Required) nstration (Hourly) – Day 4	

B = Basic

= Intermediate



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**FINISHING** 

#### **MONDAY, NOVEMBER 9**

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

# C20: CONCEPTOS BÁSICOS DE PINTURA EN POLVO EN ESPAÑOL B

En esta sesión, la cual será completamente en Español, los participantes aprenderán lo que es la aplicación en polvo; los varios tipos de recubrimientos de polvo y sus apropiadas aplicaciones; los tipos de equipo requeridos para aplicar el recubrimiento de polvo; limpieza y pre-tratamiento de las piezas antes de la aplicación de pintura; y como los recubrimientos de polvo se curan. Los participantes obtendrán un buen entendimiento de la terminología básica de la aplicación en polvo y recibirán una copia del manual de entrenamiento: "Cubierta Revestimiento de Polvo" publicado por el CCAl's.

Antonio Gallegos — George Koch Sons de Mexico Antonio Tapia, II — Coral Chemical Company Hugo A. Cambron — PPG Industries, Inc. Mario Hernandez, Jr. — Famis Inc. Rosie Orellana — AkzoNobel Powder Coatings

# C21: NEW! SPRAY BOOTH DESIGN: DO IT RIGHT ■

#### Designing the Perfect Spray Booth

This program shows the optimal way to plan booth design and anticipate the performance outcomes needed, from the quality of finish to employee protection and cost optimization. Attendees will walk away with important planning guidelines and checklists and learn how to determine effective booth design when considering key aspects of a finishing operation and how to avoid costly mistakes before and after booth installation.

Robert Hauck — Spray Systems, Inc.

#### Choosing the Best Spray Booth Technology

This presentation will provide the technical basis for selecting the best paint booth based upon the system operational requirements. Topics include: decision criteria for selecting the right technology, technologies available, differences in manual vs. robotic application booths, innovations in water wash booth technology, innovations in dry filter booths, air supply technology for spray booths, waste disposal of paint over spray for different technologies. Richard Goelz — Eisenmann Corp.

# C22: NEW! KEYS TO SUCCESSFUL FINISHING: HOOKS, RACKS & STRIPPING

#### Racking - A Key to Successful Finishing

This presentation will cover the critical role racking plays from the conception of the finishing process, and the major costs incurred by poor part density. Learn how to choose the right kind of racking for both large and small parts, and how to move parts to and from the finishing line efficiently to save time and money.

Daniel Davitz — Magic Rack / Production Plus Corp.

# "Start To Finish — The Whole Package" (Paint Hooks, Paint Stripping and Material Handling Considerations)

This presentation will describe the most basic wire hook, multi-racking and engineered robotic-type fixtures, how to justify new tooling and how proper tooling can add to the bottom line. Case studies will be presented where good choices get huge results and reduce overall cleaning costs, reduce floor space, add to productivity and ergonomics. These can be the most crucial keys to successfully operating an efficient and cost effective finishing system.

Bill Oney — American Finishing Resources

#### 1:30 PM - 3:30 PM

#### C30: NEW! POWDER COATING BASICS

# A Fundamental Understanding of a Powder Coating System

This presentation will discuss the requirements of a well-designed, high-performing powder coating system, from pretreatment, powder material selection to powder application and recovery, to curing. Learn how to make the right choices for a system to best meet your needs.

Greg Dawson — Nordson Corp. Bill E. Owens — Axalta Coating Systems John Sudges — Midwest Finishing Systems, Inc.

#### C31: BASICS OF ELECTROCOATING 🖪

#### **Understanding Electrocoat Materials**

Electrocoat is the process of using an electrical field to migrate charged colloidal particles onto an oppositely charged conductive electrode. It is highly efficient and has the ability to give uniform film thickness and to coat complex objects. This presentation will review the two types of electrocoating processes, anodic and cathodic, as well as both epoxy and acrylic based paints and their usage.

Gary Orosz — PPG Industries, Inc.

#### **Electrocoat Equipment**

This presentation will cover the equipment used in an electrocoating operation.

Chad Andreae — Therma-Tron-X, Inc.

#### **MONDAY, NOVEMBER 9**

1:30 PM - 3:30 PM

# C32: NEW! CURING OPTIONS FOR INDUSTRIAL FINISHING OPERATIONS

## UV Curing of 3D Parts — Challenges and Solutions

The use of ultraviolet (UV) radiation to initiate the curing of coatings, inks, and adhesives has been used for many years and continues to grow rapidly due to its ability to cure very quickly. One of the challenges this technology faces is that it requires "line-of-sight" for adequate curing and presents specific process challenges for curing of 3D objects. Various applications will be reviewed and the UV process solutions employed to meet the process challenges with a concentration on 3D parts/products.

Kevin Joesel — Heraeus Noblelight America LLC

# Catalytic Infrared — What is It, How Does It Work, When Should You Use It?

This session will review how catalytic infrared is generated, how it compares to convection heat and electric infrared as well as its strengths and weaknesses in applications. The same technology used for many types of process heating applications such as dry-off and cure ovens is used to clean the air. Catalytic infrared is well-suited for wet paint or powder applications. It can boost or do the entire cure of parts. Its unique properties and low operating costs make it compatible for full finishing systems or to allow companies to powder coat in a cellular application.

Marty Sawyer — Trimac Industrial Systems

#### **TUESDAY, NOVEMBER 10**

8:00 AM - 10:00 AM

C40: NEW! GETTING
YOUR PART ACROSS

#### **Getting Your Part Across**

Moving parts through the manufacturing process from one area to another can develop into a science. This presentation focuses on hanging, racking and transferring product through finishing systems. Our experts will cover conveyance methods, batch options, rack density and more while considering efficiency and cost.

Joe Laubenthal — Therma-Tron X Bruce Bryan — Mighty Hook, Inc.

# C41: NEW! THE FUTURE OF LIQUID INDUSTRIAL FINISHING

# Automation — The Future of Industrial Finishing

Automation is a growing trend in manufacturing and a necessity for many companies to remain competitive. This session will explore automation in the finishing area, including benefits, trends, and tips for assessing if automation is right for your company and the keys to implementation.

Nick Strauss — Graco, Inc.

#### The Benefits of Mastering Liquid Electrostatic Spraying

Learn how to capitalize on the full potential of electrostatic spraying with different electrostatic spray technologies, electrostatic gun and system setup, and factors that influence transfer efficiency. Methods for calculating return on investment will be presented.

Wendy Hartley — Graco, Inc.

#### Material Savings with Advanced Proportioning Systems

The use of plural component coatings has many benefits but use of 2K materials can be costly. Because the material hardens through a chemical reaction, care must be taken to use mixed 2K material prior to the expiration of the pot life. Advanced proportioning systems are designed to minimize waste that saves money, time and has a lot of environmental benefits as well.

Blake Erickson — Graco, Inc.

#### **Turn-Key Paint Shop Solutions**

In today's competitive manufacturing environment, efficiency is essential to both survival and growth. Inconsistent finish quality, inefficient pumping technologies, and material degradation can quickly erode margins. Learn how simple it can be to improve the efficiency and control of a painting operation by easily automating processes within your paint shop.

Bill Heuer — Graco, Inc.

# C42: NEW! THE SECRETS OF PURCHASING A FINISHING SYSTEM

#### A Case Study Judging the Feasibility of Purchasing a New Finishing System

Making equipment selections for a finishing operation can be difficult and confusing, as the features and designs can be diverse and numerous. This session is a complete overview of the process considerations that affect capital and operational costs while meeting production, flexibility, and quality goals. These considerations are necessary to judge the feasibility of purchasing a new finishing system. A case study will be presented.

Nicholas Liberto — Powder Coating Consultants, Division of Ninan, Inc.

#### The Secrets to Buying Equipment from a Supplier's Point of View

Can you use the internet to help in the difficult and time consuming process of buying equipment? Do you have the resources to sort through the mountains of websites and articles? Can you believe what you read? How do you get the performance that your operation needs without spending too much? This presentation is about the buying process. What makes for a good customer and what makes for a good supplier? Learn how the buying process has changed and how to make the process as painless as possible for your company.

Marty Sawyer — Trimac Industrial Systems

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

#### C50: NEW! PREVENTIVE MAINTENANCE & TROUBLESHOOTING YOUR POWDER COATING SYSTEM [A]

This session will focus on preventive maintenance and troubleshooting for powder application equipment to achieve maximum system up-time. A complete understanding of the preventive maintenance requirements of a powder coating application system and detailed application equipment troubleshooting will be presented.

John Cole — Parker Ionics Michael A. Wittenhagen — Axalta Coating Systems

#### C51: TESTING: WHY IT'S IMPORTANT & HOW TO DO IT EFFECTIVELY 🖪

#### What Color is Your Part?

Learn how a product's color is an indicator of overall product quality or process variation. This presentation will describe how to tackle applications on fabricated steel and aluminum to achieve consistent results and ensure color consistency along the supply chain. Discussion will include how color is evaluated, measured, and communicated specifically for fabricated metal products. Topics include tristimulus color scales, basic color measurement techniques, and color measurement technology.

Paul Barnes — Hunter Lab

#### Improved Pretreatment Coating Weight Measurements Using X-Ray Fluorescence (XRF)

This session will present advances in phosphate coating weight measurement including 1-sided Weigh-Strip-Weigh (WSW) coating weight measurement methods that strip pretreats of all kinds of common metal substrates without the use of chromates. Further, these methods eliminate edge effects, back side blocking complexities and 2-side averaging effects. XRF measurement of phosphate coating weights has significant advantages over WSW. Using XRF coating weight measurement allows easy cross calibration of multiple instruments. Once calibration standards have been established, calibration of the XRF instrument in this way creates traceability for subsequent XRF measurements.

Thomas W. Cape — ACT Test Panels, LLC

#### C52: NEW! OLD VS. NEW! ARE YOU READY FOR A PRETREATMENT CHANGE? III

#### Lessons Learned with Advanced Non-**Phosphorous Pretreatments**

Advanced pretreatments offer huge cost savings in the form of reduced energy requirements, waste treatment costs, manpower, and other operational costs. As with any introduction of a new technology there were growing pains. This presentation will cover some of the lessons learned when the technologies were introduced into production, along with the corrective actions, and the latest development in the advanced pretreatments.

Suresh Patel — Chemetall

#### Iron and Zinc Phosphates vs. Zirconium Pretreatments: An Overview

Many companies have converted from "Phosphate" to "Zirconium" chemistries, while many others are still reluctant to convert or even consider these chemistries. This presentation will discuss the differences, and the options available, even to companies who think they cannot implement these technologies. It will also discuss the savings and environmental benefits by converting to Zirconium processes.

Sergio Mancini — Bulk Chemicals, Inc.

#### The ABC's of Phosphate Free

The hot topic in pretreatment right now is zirconium conversion coatings. Many companies are changing from traditional Iron Phosphates to this phosphate free option. Zirconium conversion can get confusing. This session will review the tangible benefits you receive from switching which include: energy savings, reduced waste, increased paint adhesion, reduced water consumption, and increased corrosion protection. Any barriers that might prevent you from switching to a Zirconium Conversion Coating will be covered.

Larry Ensley — Hubbard-Hall Inc.

#### Pretreatments for Aluminum Metals on Steel Lines

This presentation will discuss what is needed to achieve high standards even if you do not have a five or six stage washer system. It will also show how to implement "all steel process" into one that is capable of also processing aluminum in order to achieve high performance on aluminum substrates so you can expand your market potential.

Sergio Mancini — Bulk Chemicals, Inc.





#### **TUESDAY, NOVEMBER 10**

1:00 PM - 5:00 PM

**C60: FINISHING SPRAY** PAINTING WORKSHOP

#### FINISHING Spray Painting Workshop

#### \$299 for members and \$349 for non-members

This 4-hour workshop provides hands-on training for attendees to improve finishing techniques on virtual reality spray equipment. Training will cover the fundamentals of spray application and focus on best practices to optimize spray technique to improve productivity, reduce rework and defects, and decrease air emissions. Attendees will receive a certification after completion of the workshop. Class size limited to 30 per session.

Jeremiah Treloar — University of Northern Iowa

#### WEDNESDAY, NOVEMBER 11

8:00 AM - 10:00 AM

#### C70: NEW! OPTIMIZING A BATCH POWDER COATING OPERATION III

#### 10 Critical Areas for Optimization of a **Batch Powder Coating Process**

The ten critical steps required to optimize your process, your system and the quality of your finished product will be discussed. The steps will include density, efficiency, energy and process parameters to name a few. By targeting these ten areas you can make improvements to an existing system and they will assist as you start a batch operation and be confident in the quality and volume you will achieve.

Jeffrev Hale — Gema USA Inc. Stephen Houston and Rodger Talbert — Col-Met Engineered Finishing Solutions

#### **C71: NEW! TROUBLESHOOTING FOR E-COAT IMPERFECTIONS**

This session will look at the troubleshooting process, tools to use in troubleshooting your system and tips of the trade to rid your system of imperfections. This will be an interactive session with actual parts and test panels for attendees 3uch and feel to get to the bottom of the most common imperfections found from an electrocoat system.

Jim R. Gezo — PPG Industries

#### C72: NEW! MODERNIZING THE ABRASIVE AIR BLAST FACILITY WITH TECH TOUR III

#### Modernizing the Abrasive Air Blast Facility with Tech Tour

This session will provide a general overview of abrasive air-blast facility design, and offer comprehensive information about the critical elements of a modern, productive, indoor blast facility. This presentation will help management understand all of the options available to them; why it is important to select them carefully, how to evaluate what's best, and most importantly how to increase productivity and safety and mitigate the environmental problems they face. Bringing blasting indoors or improving indoor blast operations makes good business sense.

Thomas Enger — Clemco Industries

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

#### C80: NEW! KEYS TO SUCCESSFUL PAINTING OVER HOT-DIP GALVANIZED STEEL III

Painting or powder coating hot-dip galvanized steel requires careful preparation and a good understanding of both systems. When the galvanized surface is prepared correctly, paint and powder coating adhesion is excellent, and the duplex system becomes a highly successful method of corrosion protection. However, it is very important to execute proper preparation to ensure this success. When used together the corrosion protection of the two systems combined is far superior to either protection system used independently. This is called the synergistic effect. This session will present real world experiences, the ASTM D6386 and the ASTM D7803 for powder coating over galvanized steel.

Kevin Irving — AZZ Galvanizing Frank Laster — A1 Paint, Powder and Sandblasting

#### **C81: EFFICIENT CURING** WITH INFRARED 🖪

This session will review the basics of IR including what it is, how it is produced and its characteristics. It will include all equipment sources of infrared followed by a discussion of the wide variety of IR applications, which showcase the many ways in which IR can be utilized in today's industrial environment. Attendees will also learn several ways to troubleshoot with infrared technology.

Michael Stowe — Advanced Energy Tim O'Neal — Selas Heat Technology John Podach — Fostoria Process Equipment div. of TPI Corp. Scott Bishop — Alabama Power Co.





## C82: NEW! SAFETY CODES & COMPLIANCE: HOW IMPORTANT IS IT?

#### How Safety and Quality Go Together

This presentation will focus on code compliance for safety in dust and vapor — overspray collection, ways to to prevent fires and explosions and breathing/personnel safety. It will also cover why compliance with codes and standards is in the best interest of all as it leads to better finishes and higher production with less rejects.

Martin Powell — Global Finishing Solutions

#### Understanding Agency Approvals for Liquid Electrostatic Equipment

This presentation will discuss the range of agency approvals related to liquid electrostatic applicators; FM, FMC, CSA, CE, ATEX, NFPA. These agencies offer performance, design, and installation guidelines for equipment operated in a hazardous area such as a spray booth where a potentially explosive environment can exist. This presentation will define and explain the various approvals, discuss when they are applicable, and help you gain a broader understanding when comparing various applicators so you can make an informed choice.

John Owed, Jr. — Finishing Brands

#### 1:30 PM - 3:30 PM

# C90: NEW! POWDER COATING COLOR CHANGE & TRANSFER EFFICIENCY

# Variables That Affect First Pass Transfer Efficiency in a Powder Coating Operation

Running a highly successful powder coating operation is much more than just spraying powder. This presentation will discuss the variables that affect first-pass transfer efficiency and proper set-up and operation of a powder coating system, to help maximize your bottom line results.

Frank Mohar — Nordson Corp.

#### **Confidence In Your Color Change Process**

Color change has become such a critical part of any finishing line. Most powder coating operations are looking for ways to add flexibility and get more products out the door. This presentation will focus on various applications and uses for technology designed to facilitate contamination free color change and highlight methods to reduce errors, while safely speeding up the color change cycle time.

Jeffrey Hale — Gema USA Inc.

# C91: **NEW!** GETTING THE MOST OUT OF YOUR PRETREATMENT

# Variables Affecting Iron Phosphate Coating Weights

Iron phosphate may be considered old technology, but proper training will allow employees to perform their jobs more effectively. In this presentation, the variables affecting iron phosphate coating weights will be discussed. Concentration, temperature, pH and dwell time are critical to proper coating development and the contribution of each variable will be covered to provide a better understanding on how to control and operate your surface treatment process.

Kirk Beaster — Chemetall US, Inc.

# Finishing Control Systems: Helping Companies Achieve Lean and 'Green' Manufacturing Goals

Today's competitive environment and the desire to become green are forcing companies to look at new technology that reduces costs and improves quality. This presentation will highlight how companies are using control systems in their LEAN Manufacturing processes to improve throughput and quality while focusing on being "GREEN". Case studies will include Carlisle Tire & Wheel and Agri-Fab.

John O'Connor — Calvary Industries

#### Innovations in Compliant Cleaning, Descaling, and Pretreatment Solutions for Inconsistent Substrate Quality

With more than 95% of world steel production now sourced outside the US, heavy organic contamination, scale, surface carbon and iron fines on the surface are commonly encountered in today's finishing shops. Innovative and very effective applications of cleaning packages, unique acid mixtures, polymers and traditional approaches that are environmentally compliant and energy efficient are described.

David Chalk — DuBois Chemicals

#### Modern Rust Removal to Avoid Product Rejects

Removal of rust is an important step in avoiding product rejects or quality issues. There are a variety of ways to remove rust to ensure longevity of a part. This presentation will address the different rust removal methods focusing on chemistry and process application. It will also focus on the different classes of chemicals used to remove rust along with the forms of these chemicals, with attention to modern solutions which address the weaknesses of old technology.

Michelle Bloomfield — DuBois Chemicals

#### WEDNESDAY, NOVEMBER 11

1:30 PM - 3:30 PM

**C92: NEW! SAVING COSTS ON** YOUR PLATING LINE III

#### Save Money Through Compliance

Too often companies draft basic compliance plans and then let them sit, failing to review or revise the plans to reflect new laws, new regulations or plant changes until a regulator inspects the facility. In the plating industry, the result is a violation notice along with all the time and money spent to respond. Learn some tips on how to stay on top compliance and avoid violation notices Beth Gotthelf — Butzel Long

#### Utilizing Blanking and Pilot Hole Stamping for Precious Metal Reduction

An interesting technical challenge presented itself when a customer had an unusually high amount of gold scrap. We noticed from the scrap provided that a precious metal reduction could be achieved by switching from stripe plating to spot plating. Their current part was made from Au stripe plated raw material. However, the final application only reguired plating in a very small area. By stamping pilot holes in the raw material to accurately locate an Au spot, we were able to reduce their Au costs by 65% and eliminate their scrap gold.

John Bondi — Precious Plate Inc. / Precision Process Inc.

#### THURSDAY, NOVEMBER 12

8:00 AM - 12:00 PM

C100: FINISHING SPRAY PAINTING WORKSHOP B

#### FINISHING Spray Painting Workshop

#### \$299 for members and \$349 for non-members

This 4-hour workshop provides hands-on training for attendees to improve finishing techniques on virtual reality spray equipment. Training will cover the fundamentals of spray application and focus on best practices to optimize spray technique to improve productivity, reduce rework and defects, and decrease air emissions. Attendees will receive a certification after completion of the workshop. Class size limited to 30 per session.

Jeremiah Treloar — University of Northern Iowa



#### **STAMPING**

#### **MONDAY, NOVEMBER 9**

8:00 AM - 10:00 AM

S10: NEW! SOFTWARE SOLUTIONS FOR SHEET METAL FORMING I

#### Predicting & Responding to Variations in **Sheet Metal Stamped Parts**

This presentation will discuss and define specific mechanical properties relevant to Computer Simulation of forming processes as well as introduce the fundamentals of material behavior modeling as required for simulation. Learn methods to predict and address sheet metal springback during design and engineering such as Finite Element Analysis, and define reasonable expectations of springback prediction and production stamping process repeatability.

Eric Kam — AutoForm Engineering GmbH

#### S11: PRESS TECHNOLOGY I



#### Century Press Maintenance a New Approach to an Old Problem

As manufacturing has evolved so has the need for updated maintenance procedures and record keeping. This presentation will discuss methods to make your press maintenance lean by reducing costs and increasing overall effectiveness. Learn how to use existing press systems such as tonnage monitors, brake monitors, lubrication systems, and die protection as effective tools to monitor the overall condition of the machine.

Jeff R. Fredline — Industrial Maintenance Company, LLC

10:30 AM - 12:30 PM

#### **S20: STAMPING ALUMINUM**

#### **Design Guidelines for Stamping Aluminum**

This presentation will address common misconceptions and challenges regarding aluminum stampings while providing process guidelines and practical stamping solutions. Topics include: product design guidelines, material selection, tool steel and surface coating selection, establishing proper punching & cutting clearances, and lubrication selection.

Peter Ulintz — Precision Metalforming Association

#### S21: PRESS TECHNOLOGY II 🖪

#### Advancements in Servo Technology: A Technical Brief on Different Servo Options in the Automotive Press Industry

This presentation will touch on the latest advancements in servo technology in not only traditional mechanical press applications (transfer, blanking, prog, tandem and asymmetrical presses) but also new advancements in hot stamping technologies going to mechanical servo.

Gorka Ibanez and Stephan Robertson — Fagor Arrasate S. Coop

#### Servo Force, Velocity and Position

This presentation will address servo technology and will enable a user to rethink the way they design their processes, tackle the challenges of higher strength steels and advanced materials, overcome part quality problems and reduce issues regarding press wear. Attendees will walk away with a better understanding of how to improve their process, overcome current and future challenges and obtain the most efficiency out of their investment.

Darrell Quander — Hyson Jim Landowski — Komatsu

#### 1:30 PM - 3:30 PM

#### S30: VALUE ADDED TECHNOLOGY II

## The Advantages of In-Die Fastener Installation

By combining the fastener installation process with the stamping process the secondary operation of fastener installation can be eliminated. This increases productivity by improving throughput, reducing costs, reducing WIP, and inherent through on-line inspection increases quality. A full description of the individual elements of an In Die system and how they function together to form a complete system will be reviewed. This multimedia presentation includes detailed graphics, functional animations of the internals of the die tooling and photographs of typical and unique projects.

Roger Patton — PennEngineering

## S31: PRESS TECHNOLOGY III

#### Advances in Hydraulic Press Technology

Multiple case studies with videos and samples of customer parts will be presented in a wide variety of applications such as deep drawing, coining, punching, ironing, powder compaction and assembly. This informative case study will expose the following core metal forming technologies; basic deep draw technology including programmable cushion functions, high speed servo hydraulics, quick die change, press automation including automated blank handling, servo transfers, indexing and robotics, and in-die sensing and data acquisition including OEE tracking.

Jon Schmidt and Jon Boardman — Neff Press, Inc.

#### **TUESDAY, NOVEMBER 10**

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

# S40: SOFTWARE SOLUTIONS FOR SHEET METAL FORMING II

# Making Simulation a REALITY: Mapping the Effects of the Production Stamping Environment to Computer Analysis

In this session, participants will identify common sources of variation in the stamping environment and relate them to the common inputs and assumptions made during the engineering process and stamping simulation. Participants will be introduced to methods and practices which can inform engineers as to the repeatability of the simulation results in reality and validity of the computer simulation.

Eric Kam — AutoForm Engineering GmbH

#### S41: ERROR PROOFING I 🖪

#### **Die Protection and Sensor Basics**

Starting with an overview of the many types of sensors commonly used for die protection, attendees will learn how to select and properly apply the right sensor for any application. Using real-world examples, the advantages and limitations of each sensor type, as well as tips and tricks on sensors selection, installation, and wiring, will be highlighted.

Jim Finnerty — Wintriss Controls Group

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

# S50: NEW! ADVANCED HIGH-STRENGTH STEEL (AHSS) TECHNOLOGY I

#### Current Production Applications of Future Steel Vehicle New Technologies

Newly developed AHSS grades have increased in tensile strength, innovative steel processes have made application of these AHSS grades more effective and 3G (gage, grade and geometry) design optimization has been applied to generate significant mass and cost savings as projected by the original study. This presentation will review current production examples of lightweighting of body sheet components using the new technologies, which were first introduced in the FSV program.

David Anderson — Steel Market Development Institute

#### S51: ERROR PROOFING II 🔼

#### Advanced Die Protection & Error-Proofing with Case Studies Presenters

This session will focus on the implementation of a serious die protection and error-proofing program for metalforming & assembly companies. The uses of electronic sensors for die protection as well as indie part quality monitoring and automatic self-adjusting tooling with servo motors will be discussed.

George Keremedjiev — Tecknow Education Services, Inc. Beth Roberts — Automatic Spring Products

Harold J. Didricksen — Kenmode Tool & Engineering Bill Schell — Art Technologies

Dirk Holcomb — A Raymond Timmerman Manufacturing

#### **TUESDAY, NOVEMBER 10**

1:30 PM - 3:30 PM

**S60: ADVANCED HIGH-STRENGTH** STEEL (AHSS) TECHNOLOGY II

#### How Higher-Strength Materials Affect Pressroom Equipment and Die Maintenance

This presentation examines a number of different material types (e.g., aluminum alloys, high strength steels, and stainless steels) that are commonly used today in commercial, automotive and aerospace products and the affect that they have on the metal stamping process. Guidelines for designing dies, selecting press room equipment, and implementing appropriate die maintenance routines based on specific material properties and their influence on the stamping process will be discussed.

Peter Ulintz — Precision Metalforming Association

#### Solution Technologies of Die Material Coating and Tooling High-Strength Steels Stamping Dies

Increased lighter weight vehicle elements and vehicle-safety requirements drive increased application of advanced high-strength steels (AHSS). Stamping dies face various problems, like the galling of the surface of drawing dies and cracked cutting edges of trim dies. The problems cause issues for stampers like the increase in the application of 980MPa AHSS and higher strength. Also, in order to get dies ready in time to launch new model cars, die builders have a shorter period of time to complete the die. Hitachi Metals continues to research and develop die materials, coating technologies and tooling technologies to help stampers and stamping die builders solve these problems.

Tom Bell — Hitachi Metals

#### S61: NEW! ERROR PROOFING III III

#### Quality Management for Press Shops: In-Die Process Validation, Post-Stamping **Check Stations & Error**

For management, quality engineers and supervisors in stamping operations, part quality can be a source of frustration. Teams need to identify quality issues early & adjust quickly so they can have zero defects shipped to customers. This is readily accomplished through in-die process validation, electronic measurement and part tracking. Through real world examples we will discuss how press shops are successfully implementing 100% inspection of finished parts regardless of automation level.

Will E. Healy, III and Dave Bird — Balluff Inc.

#### WEDNESDAY, NOVEMBER 11

8:00 AM - 10:00 AM

#### S70: NEW! LUBRICATION TECHNOLOGY

#### LUBRINOMICS - The Science of Lubrication & Economics in **Metal Stamping**

Lubricants are required during the stamping process and can make a major impact to the success or failure of an operation. Understanding the different chemistries available and how to best apply these to your specific operation for greatest success rates and process compatibility is important. Not all lubricants are created or perform equally. Determine how to evaluate different lubricants during a trial, learn industry best practices, and important metrics for overall success and improving the bottom line.

Steve Lowery — Tower Oil & Technology Co.

#### **Understanding Chlorinated Paraffins in** Metalforming Lubricants

Learn how extreme pressure additives affect the workability of stamping lubricants. This session will cover the future of metalforming lubricants, the government action on chlorinated paraffins, understanding the global regulatory system and the use of extreme pressure additives in metalforming lubricants.

Steve Lowery — Tower Oil & Technology Co. Jim MacNeil — Oualice LLC

10:30 AM - 12:30 PM

#### **S80: NEW! PRESSROOM SAFETY AND** PERFORMANCE B

#### Installation Technology to Improve the Performance of Metalforming Presses

This presentation will explore the relationship between installation methods and its effects on machine productivity and the surrounding environment using technical illustrations and case studies. The characteristics of a wide variety of isolators and mounting systems will be covered including elastomeric (rubber) and steel coil spring systems.

Keith Leatherwood — Vibro/Dynamics Corp.

#### OSHA 1910.147 Control of Hazardous Energy, Risk Assessment and Alternative **Control Measures in Stamping Applications**

Providing a risk assessment allows employers to meet the requirements of OSHA "general duty" clause (5A1of the act) which requires employers to keep the workplace "free from recognized hazards". This presentation will provide guidance to the process and steps for performing a risk assessment for the overall safety of the stamping machines, and to assist in the application of OSHA 1910.147 control of hazardous energy, as well as some of the additional benefits that can be gained as a result of upgrading production equipment for use with alternative control measures as they apply to the control of hazardous energy.

Ted Sberna — White Horse Safety





#### 1:30 PM - 3:30 PM

# S90: NEW! EDDY CURRENT VS. VARIABLE FREQUENCY DRIVES APPLICATIONS

# Eddy Current vs. Variable Frequency Drives Applications

Eddy Current Drives and Variable Frequency Drives have been employed to provide variable speed control for machines for many years. This session focuses on applications for (mechanical) metal stamping/metal forming presses and the argument that Eddy Current Drive technology best serves applications for presses than do their VFD counterparts.

David H. Stroner — DSI Dynamatic



#### **LASERS & CUTTING**

#### **MONDAY, NOVEMBER 9**

8:00 AM - 10:00 AM

# F10: NEW! ADVANCES IN LASER JOINING APPLICATIONS I

## Advances in Fiber Laser Welding for Metals Joining

This presentation discusses advances in laser welding optics technology including welding with high speed beam oscillation and beam shaping optics. It will highlight the new Laser Seam Stepper (LSS), a device that incorporates the advantages of resistance spot welding and laser welding and show some of its latest applications in the industry.

Eric Stiles — IPG Photonics Midwest

#### Laser Welding Solutions with Medium Power Fiber Lasers

Medium power fiber lasers offer a robust solution, with a lower cost of entry, for laser welding in a wide range of applications in general consumer, light industrial and high reliability precision devices. Medium power fiber lasers typically fall in the range of 100 Watts to 1000 Watts of average power and are available as CW and modulated-pulsed lasers with single and multimode beams. These features make fiber laser particularly attractive because of the ability to perform well in multiple operating modes, from fast modulation to pulse and CW operation from a single beam source. This presentation will cover these features and solutions to overcome challenges in spot or pulse welding.

Daniel Capostagno — SPI Lasers

#### Advances in the Capabilities & Implementation of Remote Laser Welding

Recent advancements in remote laser welding now make welding on-the-fly simple to implement, optimize and maintain. A discussion of how these advancements have dramatically increased the productivity, process robustness and extended the implementation to edge fillet welding will be discussed, as well as a peek into future advancements.

Tim Morris — Blackbird Robotics North America

#### Laser Welding Applications in Sheet Metal

For decades now the laser has been the default cutting technology in the sheet metal industry, renowned for its speed, efficiency and flexibility. Today a new purpose for the laser is growing in popularity amongst sheet metal manufacturers: laser welding. Known for its speed, strength, aesthetic appeal and substantially reduced production costs by way of the elimination of downstream processes, conventional welding applications are quickly being replaced by this ever-growing technology.

Brett Thompson — TRUMPF Inc.

10:30 AM - 12:30 PM

# F20: NEW! ADVANCES IN LASER JOINING APPLICATIONS II

# New Design Opportunities Enabled by Innovative Laser Edge Welding

Laser edge welding in BIW enables designers to drastically reduce flanges to 4 mm resulting in a variety of design opportunities. By continuously measuring the actual joint configuration via optical means, this edge welding technology can accurately position the laser spot directly between both mating sheets independently or part of robot path accuracies. The innovation enables welds with larger weld fusion areas compared to state of the art laser welding. Both properties of laser edge welds empower designers to apply more stiffness to the BIW even with reduced flange widths.

Tom Graham — Abicor Binzel

#### The Effect of Processing Parameters on the Quality of Electron Beam Freeform Fabricated Metal Matrix Composite Structures

Electron beam additive manufacturing is being explored to produce metal matrix composite (MMC) parts for aerospace applications. Powder cored tubular wire consumables with an Al 6061/10 vol. % SiCp target composition were developed for electron beam freeform fabrication (EBF3) to produce MMC structures with properties comparable to wrought products. A series of varied deposition conditions was created to improve the interaction between the electron beam and silicon carbide particles to enhance particle recovery and dispersion in the matrix. A set of processing conditions was created to improve the as-solidified metal matrix composite structure.

Devon Gonzales — Colorado School of Mines

#### **MONDAY, NOVEMBER 9**

1:30 PM - 3:30 PM

#### F30: NEW! LASER PROCESSING 101 🖪

#### **Current State of Solid State Lasers**

This presentation will cover current technological advances in solid state lasers, including specific cutting advancements, and will conclude with where solid state lasers are heading.

Jason Hillenbrand — Amada America, Inc.

#### **Design Considerations for Laser Welding**

The understanding of topics such as welding and material considerations, weld joint types and tolerance requirements, and designing components and assemblies for laser welding are all critical to successful implementation of the laser welding process. These are presented along with numerous practical examples and case studies, with the intent of building the foundation for sound laser welding design and process implementation.

David Havrilla — TRUMPF Inc.

#### **Industrial Laser Cladding 101**

Laser cladding uses a laser to deposit a layer of material onto a substrate by way of powder or wire. This process is used for refurbishing damaged parts to OEM specs, repairing worn surfaces, and providing enhanced corrosion/erosion resistance. The presentation will discuss laser cladding techniques used in industrial applications such as cladding of boiler tubes, water walls, downhole tools, hydraulic shafts, and additional oil & gas tools.

Wayne Penn — Alabama Laser

#### **Fundamentals of Industrial Laser Safety** with Case Studies

A fundamental knowledge of laser safety is critical. Discover the essential elements of laser safety with case study examples to re-enforce this information. Explore the duties of the laser safety officer including regulatory pitfalls and compliance to safety standards. Also, arm yourself with vital laser safety protective equipment information including basics of how to select laser safety eyewear, windows and harriers

Ken Barat — Laservision USA

#### **TUESDAY, NOVEMBER 10**

8:00 AM - 10:00 AM

#### F40: NEW! INDUSTRIAL LASER BEAM TECHNOLOGY II

#### Laserline Diode Lasers in Materials Processing More Possibilities than Ever Before

This presentation outlines current capabilities in materials processing with High Power Diode lasers with examples. It will also provide a summary and outlook for the future: as well as recent innovations.

Wolfgang Todt and Alexander Groth — Laserline, Inc.

#### Influence of the Beam Quality on Fiber Laser Cut Characteristics for Highly Reflective Materials

Fiber lasers have been shown to be very effective at cutting highly reflective materials such as aluminum, brass and copper. The need for increasing processing speeds, reducing the amount of dross and obtain excellent edge quality on thicker materials, which are dependent on the laser beam characteristics, constitute good reasons to investigate the influence of the laser beam quality on the cut attributes. The outcome of the study on brass along with guidelines on optimum beam parameters for given material thicknesses is presented.

Jean-Philippe Lavoie — Coherent

#### High Brightness Multi-kilowatt Direct Diode Laser Applications Using Wavelength Beam Combining Technology

This session presents the latest results using 2 and 4kW TeraBlade direct diode laser for metal processing applications and compares them against other conventional near infrared lasers.

Francisco Villarreal and Bryce Samson — TeraDiode Inc.

10:30 AM - 12:30 PM

#### F50: NEW! CUTTING BEST PRACTICES [[]

#### Tips, Techniques and Best Practices to Improve Bevel Cutting Success

This presentation will discuss common obstacles to bevel cutting and present basic steps to help ensure bevel cutting success. Common bevel cutting problems, understanding machine-specific issues, precutting steps for success, best practices and beveling software will be presented. Anyone charged with improving fabrication processes and productivity will benefit from this presentation.

Bruce Renfro — SigmaTEK Systems, LLC

#### Oxy-fuel Cutting — Effect of Oxygen Purity

For many applications of cutting, it's believed that it's best to use 99% pure oxygen because it reduces the amount of nitrogen in gas, and allows the metal to be oxidized quickly. Although oxygen that is produced from vacuum swing adsorption (VSA) has a lower purity than cryogenic oxygen, it has < 1% of nitrogen. This session will discuss the differences between cutting using 99% pure oxygen produced by cryogenic separation and cutting with 93% and lower purity oxygen produced from VSA.

Erin Meehan and Frank Vonesh — Pacific Consolidated Industries

#### Productivity and How Breakthrough Plasma Cutting Technologies are Impacting Your Bottom Line

Learn how the latest developments in plasma cutting technology are increasing productivity. True Hole, True Bevel, Rapid Part technology all contribute to the productivity of your plasma cutting operation. The presentation will cover how these technologies are further advancing plasma cutting, not only in new applications, but also are significantly contributing to productivity and your bottom line.

Dan McLenithan — Hypertherm, Inc.







# Optimizing Abrasive Management for Waterjet Operations

Abrasive represents over half of the operating cost in abrasive waterjet cutting applications. Effectively optimizing abrasive utilization plays an important role in optimizing profitability. Learn about techniques used on the front end and the back end of the cutting process to optimize your abrasive usage and improve your profitability.

Sara Mancell and Arion Vandergon — Hypertherm, Inc.

#### 1:30 PM - 3:30 PM

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#### Waterjet Cutting

Learn about the very latest in waterjet technology and applying waterjet technology to new applications, as well as how to get the most out of your waterjet and the future of waterjet technology.

Tim Fabian — Flow International

#### Plasma Cutting

Discover how new advancements in plasma plate cutting technology have increased pierce thickness, allowing plasma to replace oxy-fuel in materials to 2" with faster speeds, lower costs, and often better cut quality. Recent improvements that make it possible to "plasma" drill holes in plate to 1" thick with no secondary operations required will also be reviewed.

Jim Colt — Hypertherm, Inc.

#### Laser Cutting

This session will focus on changes in both fiber and CO2 lasers, machines and automation. Cutting speeds and operating costs for both types of lasers will be covered.

Mike Pellecchia — Mitsubishi/MC Machinery Systems Inc.

#### **WEDNESDAY, NOVEMBER 11**

8:00 AM - 10:00 AM

# F70: NEW! LASER BEAM AND PROCESS MONITORING

#### Top Five Situations Where Laser Performance Measurement is Necessary

Only through the measurement of a set of key laser characteristics, can the laser user truly start to understand the behavior of the laser system, control the changes that will occur in the system over time, and more thoroughly and effectively maintain it during routine or corrective maintenance periods. This session will discuss five situations where measurement of the laser system, as a whole, must be done in order to ensure a consistent, quality laser process during the entire life of the laser system.

John McCauley — Ophir Photonics Group

## Online 3D Imaging for Laser Welding: Process Control and Beyond

The introduction of inline coherent imaging technologies as a sensor for the laser materials processing is accompanied by the integration into several applications. One of these is the measurement of the depth of the vapor capillary for laser welding applications, now allowing it to keep record of the welding depth with an accuracy of micrometers and a sub millisecond temporal resolution. The broader achievement is the closed-loop control of the welding depth that was not available in industrial environments till now due to the lack of an adequate sensor. Further use includes the acquisition of 3D images around the laser process itself, allowing for coaxial integration of pre- and post-process sensors. These applications are demonstrated by using the Precitec In-Process Depth Meter (IDM).

Thibault Bautze — Precitec GmbH & Co. KG

# Direct Measurement and Control of Welding with Inline Coherent Imaging

Inline Coherent Imaging (ICI) is a new technology that allows direct visualization of the melt pool, including keyhole depth, in real-time. The ICI system is easily interfaced to existing camera ports, and is natively compatible with new weld heads. New advances in 3D measurement allow for video-rate visualization of part geometry for setup, as well as integrated seam tracking and autofocus, all with a single instrument. This presentation will introduce these and many other exciting capabilities that are now available for industrial deployment.

Paul Webster — Laser Depth Dynamics

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

# F80: NEW! INNOVATIONS IN INDUSTRIAL SYSTEM TECHNOLOGY I

#### Productivity and Profit: Achieve New Levels of Success from CAM Nesting Software

Learn how the latest developments in CAM Nesting Software provide for game-changing impact to total enterprise productivity and profitability. The presentation will cover the significance of built-in-process expertise and its impact on productivity, cost and quality management, and cutting process selection. Also covered will be CAM integration to enterprise software solutions (MRP/ERP), highlighting the business value and outcomes possible from these powerful software relationships within industrial cutting environments.

Derek Weston — Hypertherm, Inc.

#### WEDNESDAY, NOVEMBER 11

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

#### Laser Head Crashes: The Impact of Impact

In an effort to cut metal as quickly as possible countless cutting torches are needlessly damaged. When a crash between machine and material occurs the damage to the torch is likely fatal. Likewise machine-time and man-hours lost recalibrating or replacing damaged cutting torches are significant and non-recoupable. This presentation will discuss common causes of laser head crashing and how they are best avoided.

Scott Grindstaff — SigmaTEK Systems, LLC

#### CO2 Laser Cutting Application Flexibility for Metal and Organic Substrate **Applications**

This session will focus on the possibilities - both in terms of flexibility and productivity - for cutting with CO2 lasers. It will shed significant light on innovations in laser cutting that yield increased profit potential for fabricators while also highlighting the areas of capability and limitations of this technology. Emphasis on the critical properties of these technologies will help to define the functional performance attributes that set the capability areas.

Robert W. Boyes — Coherent Inc.

#### The Increasing Application of High-end Plasma Systems in 3D Cutting Solutions

Plasma cutting systems have a rich history of use in the world of two-dimensional plate cutting, where it was first applied and where it has proven to dramatically reduce production costs in many applications. However, today high-end plasma is also being integrated into robotic and other 3D cutting technologies to create fully integrated and automated manufacturing processes that dramatically increase efficiency and throughput. Information presented will enable attendees to better understand the increasing importance of plasma cutting technology in the 3D space as well as identify key drivers and enablers that explain why this is occurring.

Phil Parker — Hypertherm, Inc.

#### 1:30 PM - 3:30 PM

#### F90: NEW! INNOVATIONS IN INDUSTRIAL SYSTEM TECHNOLOGY II

#### SureCut Technology — Elevating **Embedded Expertise**

SureCut elevates embedded process expertise through applications ("apps") that markedly simplify the cutting process for end users with limited operator intervention. This allows customers to obtain optimal performance and cutting table satisfaction. We will discuss each app in detail as well as cover the new CNC platform on which they run.

Abhi Sharma and Dan McLenithan — Hypertherm, Inc.

#### Industry 4.0: Upcoming Challenges for 3D Laser Systems in the New Age

In the new age of industry 4.0 standard, 3D laser machine suppliers are faced with new market demands to stay competitive. Criteria like retraceability of all single components, highly automated unattended operation, remote maintenance and especially master computer interfacing have to be handled. The presentation will offer solutions and examples which have already been realized by the leading laser system supplier and where the journey will lead us in the future.

Thomas Kirchhoff — TRUMPF Laser-und Systemtechnik

#### **Fibernomics**

Fibernomics is not just the economics of owning a fiber, but the overall economic advantage that is created when all of the everyday demands on the shop floor are met with the production capabilities of fiber lasers.

Mitch J. VanZuiden — Bystronic Inc.

#### Laser Drilling in the um Range: Five Axes Do it Better

Laser drilling of high aspect ratio holes presents challenges for controlling the geometry of the hole. Learn how a five axis scanning system creates entirely new possibilities to develop and execute processes superior to typical percussion drilling, spiral drilling and trepanning.

Dale Sabo — ScanLab America

#### **FABTECH Bistro**

Reserve a seat at the FABTECH Bistro and you will always have a convenient place to eat, meet and network. The Bistro offers assorted menu options including fresh and healthy lunch options, international cuisine and regional favorites — all at a reasonable price. Pre-purchase your individual lunch tickets to avoid the lines. Find the daily menu, pricing and order tickets at fabtechbistro.com.





LEAN

#### **MONDAY, NOVEMBER 9**

8:00 AM - 10:00 AM

F11: LEAN PRINCIPLE: STRATEGIC PLANNING AND ORGANIZATIONAL ALIGNMENT II

#### Achieving Higher Performance Results and Greater Employee Engagement Through Business Plan Deployment

The use of Lean Manufacturing methods has yielded significant reductions in waste, improved quality, lower operating costs and increased profitability. To reach the next level of performance and results through continuous improvement, the use of a Business Plan Deployment process enables the total organization to set targets, integrate plans, and remain focused to achieve company-wide business priorities while managing change.

Joseph M. Mazzeo — Integrated Lean and Quality Solutions, LLC

# Empowering Your Front Line Using the Run Improve Grow® Business Model

The Run Improve Grow® business model helps companies move from a place of mediocrity to a place of true excellence. This field-tested method allows companies to build solid—and simplified—foundations that allow them to focus on growth and empower their front lines to take true ownership of the essential day-to-day operations. With a fearless front line team in place, middle managers are able to step out of the "Run" and start focusing on proactive improvements, thus liberating the upper management to concentrate on areas of bold growth.

Rich Cary — Definity Partners

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

# F21: NEW! LEAN PRINCIPLE: DEVELOPING PEOPLE AND PROCESSES I

#### Freedom Teams, Freedom Systems: Taking Your Business and You to the Next Level

If owning your own company and working for yourself has the to-do items, emails, and phone messages piling up and you're cracking under the load of the business you created, then you need Freedom Teams and Freedom Systems—the people and processes to keep you "in the air" doing what you do best. Learn how to build a team that complements your strengths and compensates for your weakness, and how to build systems to automate and optimize your performance.

Jon Goldman — Brand Launcher

#### ediate 🔼 = Advanced

#### Lean Leadership... Are You Prepared to Lead?

This presentation is designed to identify and explore the concepts of Lean Leadership while providing a framework for assessing your skills. Lean Leadership is an essential tool for managers whose firms are embarking on a Lean Journey or who are already on their way. Often times we fail to lead differently and then wonder why we are not achieving the results we expected. Stop wondering and come explore the opportunities to lead in a Lean framework and secure the benefits from your program.

Patrick Lucansky, Jr. and Larry Bauman — Value Innovation Partners, Ltd

1:30 PM - 3:30 PM

# F31: NEW! LEAN PRINCIPLE: BUSINESS STRATEGY FOR SUSTAINABILITY

# Taking Your Business and You to the Next Level

Congratulations — you've made it past the ten-year mark. But if you're like many other companies, you've arrived at the "Too Big, Too Small" stage of the game. You're Too Big to keep doing things the way you've done them until now, but you're Too Small to start pouring massive investments into your company. You need a plan for making the next ten years productive and profitable. This session reveals the steps you need to take to build a company that is valuable, sustainable, and ultimately, salable.

Jon Goldman — Brand Launcher

#### **TUESDAY, NOVEMBER 10**

8:00 AM - 10:00 AM

F41: LEAN TOOLS: VALUE STREAM MAPPING

#### Lean Tools: Value Stream Mapping

Many who have tried VSM off the plant floor have stumbled due to the different nature of office processes. Success requires a different approach at almost every step. Properly performed, VSM helps address issues in highly cross-functional processes related to: organizational alignment, leadership engagement, directing teams and consensus building. Leave this presentation armed with new insights on how to VSM most any process.

 ${\it Patrick\ Lucansky -- Value\ Innovation\ Partners,\ Ltd.}$ 

#### **TUESDAY, NOVEMBER 10**

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

#### F51: LEAN PRINCIPLE: BUILDING **3D SUPPLY CHAINS FOR** LEAN MANAGEMENT

#### **Building 3D Value Chains**

This presentation will focus on what 3D Value Chains are and what this strategy means for future manufacturing success and profitability. Attendees will learn what will drive manufacturing productivity in 2015 and beyond, how to develop and implement a 3D Value Chain Strategy and what the roadblocks to success are.

Alan Lund — CORE Business Management Solutions

#### Advances in 3D Robot Simulation and Beyond

3D Simulation has been implemented in a relatively small segment of manufacturing environments. However, little to no consideration has been given to the impact this technology can play in the full spectrum of disciplines within those same manufacturing enterprises. These range from facility planning to equipment purchasing to resource allocation and beyond. No longer are these software tools reserved for the OEMs but can be deployed into the Tier Supplier networks. It can be said that 3D Simulation is the spinal cord for the global manufacturing backbone for all industries and products.

Robert J. Axtman — Visual Components North America Corp.

#### 1:30 PM - 3:30 PM

#### F61: LEAN TOOLS: QUICK CHANGEOVER AND TPM

#### Lean Tools: Quick Changeover and TPM

Machine uptime is a critical metric of performance in high mix operations. This session addresses the issue of uptime directly and demonstrates how to maximize uptime (and reduce investment) through practical techniques to reduce changeover times in fabrication processes and keep the equipment ready to run through productive, economical maintenance. Richard Kallage — KDC & Associates, Ltd.

#### WEDNESDAY, NOVEMBER 11

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

#### F71: LEAN TOOLS: FLOW & PULL II



#### Improving Flow Through Practical Lean **Technologies & Tools**

During this session, attendees will: learn how to do a basic SWOT analysis of your company to determine its core competency; determine what steps are required to prepare you for a successful lean journey; see a practical demo of how a Flow Assessment Tool can help you easily visualize/map 100's of different routings of parts produced in a high mix, low volume shop; leverage information gathered from the Flow Assessment Tool to streamline material flow, complete orders faster, and increase shop floor productivity.

David Lechleitner — Exact Online Shahrukh Irani — Lean & Flexible, LLC

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

#### F81: LEAN TOOLS: 5S WORKPLACE **ORGANIZATION AND** STANDARDIZATION III

#### Lean Tools: 5S Workplace Organization and Standardization

Understand how the 5S system will help you correctly apply the lean techniques through making waste visible and supporting standardized work reguirements and learn the purpose behind each step and the criteria to evaluate how well each "S" has been implemented. Get a structured format to start using this technique right away in your organization in order to create a pathway for lean implementation. Be able to start the 5S practices and permeate that throughout the organization to make it part of your company culture.

Anthony Manos — Profero, Inc.

#### 1:30 PM - 3:30 PM

#### F91: LEAN PRINCIPLE: VISUAL **WORKPLACE**

#### Visual Flow for Operational Excellence

This presentation will discuss the importance of visual flow and how to implement it by demonstrating how to make normal and abnormal flow visual so employees can see when flow stops. Case studies of companies who have designed visual flow will show how flow to the customer is progressing and see whether a disruption in flow is imminent. Learn how employees at these organizations use standard responses to correct breakdowns, without management interventions — freeing management to focus on growing the business. The presentation will also share how progressive companies are transforming their operations beyond lean to achieve Operational Excellence.

Kevin Duggan — Institute for Operational Excellence



#### **THURSDAY, NOVEMBER 12**

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

# F101: NEW! LEAN TOOLS FOR SUSTAINABLE OPERATIONS

#### Sustaining Improvement Workshop

This session will address the specific issues and problems encountered in sustaining improvement initiatives. The agenda will be built around the situations and challenges of the participants, with facilitated discussion among the participants and specific takeaways to help participants overcome their specific challenges and sustain improvement initiatives.

Paul Vragel — 4aBetterBusiness, Inc.

# What is an Operational Excellence Sustainment System?

Learn about a systematic approach to waste identification and elimination utilizing LEAN/Six Sigma tools and techniques while operating within a (PBL) non-negotiable business process environment. Tools include: 5S+1, Kaizen, A3 Thinking, Problem Solving – PDCA (Plan-Do-Check-Act) – LAMDA, Process Mapping – VSM, Visual Management, etc.

Korey Zawadzki — Competitive Solutions, Inc.

#### Driving a Built-in-Quality Culture

True gains in quality are ultimately achieved when an organization embraces and works toward a Built-in-Quality culture. This presentation will explain the concept of BIQ and what is needed to achieve it in any organization. Attendees will receive these specific tools/knowledge to put to immediate use: basic principles of lean manufacturing, how the concept of Built-in-Quality fits, how to begin to assess a company's current quality position, describe some of the methods and tools used with BIQ and how to begin a BIQ culture.

Joseph M. Mazzeo — Integrated Lean and Quality Solutions, LLC



**MANAGEMENT** 

#### **MONDAY, NOVEMBER 9**

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

# F12: WORKFORCE: INNOVATION AND TEAM BUILDING STRATEGIES

#### **Innovation and Team Building Strategies**

This presentation will explore strategies for team building to help businesses find innovative solutions to the issues they face. Gain knowledge on several ways team leaders can manage cross-functional, intra-departmental and even multi-cultural team situations to realize meaningful business results.

Cullen Hackler — Porcelain Enamel Institute, Inc.

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

# F22: NEW! WORKFORCE: NEW APPROACHES AND STRATEGIES FOR THE NEXT GENERATION

#### **Developing the Next Generation Leader**

Without a well-defined development plan the preparation of the next generation leader will be left to chance. You have worked too hard to let this risk affect your business. Imagine what your employees and customers think when they don't see a defined future. A case study of what one owner did and other ways to prepare the next generation leader will be presented.

Mark Ernst — Ernst Enterprises, LLC

#### Securing Your Business for the Next Generation: Why Now is the Time for Business Succession Planning

For owners of manufacturing, fabricating, and other capital-intensive businesses, the need to be proactive about succession planning is particularly acute. This presentation examines the financial, legal, and family problems that can result from a lack of proper succession planning and describe the elements of an effective succession plan, regardless of whether the next generation of leaders will come from within the family, key employees or third-party buyers.

Jonathan Michael — Burke, Warren, MacKay & Serritella



#### MONDAY, NOVEMBER 9

10:30 AM - 12:30 PM

F23: NEW! FRAMEWORK FOR PRODUCT **DEVELOPMENT STRATEGIES** 

#### Framework for Successful Product **Development Strategies**

This session will explore a structured approach to product development to ensure that in each step, necessary information is generated and related to the overall goals. The development process starts with exploring and prioritizing customer needs. The concept development process builds on this information and helps to evaluate different concepts as well as ensures that technical and commercial parameters are linked to the development phases. As manufacturing costs are determined -to a large extent- in this phase, economic parameters and sensitivity analyses are used to ensure commercial competitiveness.

Joe (Joachim) Mayer — Mayer Business Group

1:30 PM - 3:30 PM

#### F32: NEW! WORKFORCE: LEADERSHIP STRATEGIES AND TOOLS FOR MANAGING YOUR ORGANIZATION III

#### The Roles and Responsibility of Leadership in Guiding Your Company

The need for effective leadership is key to an organization's success. While many large companies focus on developing and improving leadership behaviors and results, this is often overlooked in small or single owner companies. This presentation delves into how any company, of any size, and its leaders can and will benefit from focusing on how to improve leadership performance.

Joseph M. Mazzeo -Integrated Lean and Quality Solutions, LLC

#### Leadership Impact

What is your impact as a leader? Do you create fear or trust in your organization? How does your team respond to you? Find out how to drive the fear out of your company and replace it with trust to unleash the pent up potential of your team.

Judy Ferraro — Judy Ferraro & Associates Jean Pitzo — Ace Metal Crafts

#### F33: NEW! TECH TRENDS: EMERGING THREATS, DISRUPTIONS AND OPPORTUNITIES IN THE FABRICATION INDUSTRY M

#### Emerging Threats, Disruptions and Opportunities in the Fabrication Industry

Fast moving technology advancements in machines, equipment and software as well as new OEM sourcing strategies present serious threats over the next 5-10 years to the custom fabrication industry. They also present opportunities for those positioned to capitalize on the changes that will occur. Fabricators must understand the factors driving inevitable change, assess their impact on their business, and begin making the moves that are necessary to successfully exploit the future.

Richard Kallage — KDC & Associates, Ltd.

#### **TUESDAY, NOVEMBER 10**

8:00 AM - 10:00 AM

F43: NEW! RISK AND ASSET **MANAGEMENT: WHAT YOU NEED** TO KNOW!

#### Strategies That May Help You \$ave Thousand\$ on Your Annual Business Insurance \$pend

The annual spend on business insurance can be significant. Past claims experience, safety/ risk management practices, hiring practices, choice of insurance broker/agent, etc. can all impact those costs. Learn strategies and practices that have proven results in the marketplace on where you can exercise some control/influence when it comes to business insurance expense.

Bill Morway — Market Financial Group

#### What Every Industry Professional Needs to Know About Asset Protection, Tax Reduction, and Estate Planning

This presentation will help metal forming and fabricating industry professionals structure themselves for lawsuit protection and prevention, reduce liability insurance costs, minimize taxes, and create successful estate and business succession plans.

Larry Oxenham — American Society for Asset Protection

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

#### F53: NEW! MANAGING FOR VALUE: EXTRAORDINARY ENTERPRISE 🔼

#### Managing For Value: An Owners Guide to **Maximizing Fabrication Business Worth**

Knowing the core underlying drivers of business value provides owners a means of taking high-impact and consistent action to maximize the value of their business in both the short and long term. Further, owners can leverage scarce resources by understanding the relationships among the various drivers. Learn the key factors that drive realizable value, the relationships of these drivers, available high-leverage choices, and value-improving steps that are most important for your business.

Richard Kallage — KDC & Associates, Ltd.







#### How Ordinary Manufacturing Companies Can Create Extraordinary Enterprise Value

More recent mergers and acquisition transactions involve manufacturers. The market is telling us manufacturing companies are in demand and now may be the time to consider your alternatives. However, as important as timing is to the market value of a company, there are other factors that affect a company's attractiveness. This presentation identifies those value creation factors and provides a proven tool and methodology that participants can use to perform a strategic value assessment. Learn how to develop a value enhancement roadmap that will create extraordinary enterprise value.

Joel Strom — CKS Advisors, LLC

#### 1:30 PM - 3:30 PM

# F62: WORKFORCE: BUILDING A COMPETENCY BASED TRAINING & DEVELOPMENT PROGRAM WORKSHOP

#### Building a Competency Based Training & Development Program Workshop

This workshop will walk participants through the process of building a competency-based training program, based on critical manufacturing business needs. The process will show the leveraging of the standard machining competency and how to customize the standard to specific customer needs. More tools provided for a successful implementation. John Hindman — Tooling U-SME

# F63: NEW! GROWTH BY MAKING STRATEGIC ACQUISITIONS A

# Metal Fabrication Merger and Acquisition Industry Review

This presentation will review comparable metal fabrication sale transactions. Participants will gain a clear understanding of what drives value for many different types of metal fabricators and finishing companies. Participants will learn from case studies that review recent comps, as well as, get a detailed explanation of criteria driving value from financial buyers and strategic buyers.

Matthew Bradbury — Business Acquisition & Merger Associates

#### Winning the Game of Acquisitions

Learn the essential ingredients for a winning mergers and acquisitions program with a new strategic framework for successful acquisitions. Utilizing a 4-part business model, this presentation will give you the tools to build the path to deals, find targets and use practical steps to gain a winning outcome and avoid common pitfalls.

Douglas Nix — Corporate Finance Associates

## Growth Through Acquisition — Good or Bad Idea?

This presentation will help answer the question "Is an acquisition a good or bad idea for our company"? Learn how a company can use 6 key criteria to evaluate their readiness for an acquisition, determine what they need to do to prepare for one, and then develop an acquisition strategy that will increase their opportunity for exceeding expectations. Case studies provided.

Joel Strom — CKS Advisors LLC

#### WEDNESDAY, NOVEMBER 11

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

# Build Accountability into Your Organization

Learn to identify the practical actions necessary to increase accountability in your organization. This presentation will give you the tools to create rewards and consequences to influence desired behaviors and teach you how to use them more effectively, as well as, discuss the practices that discourage accountability.

Mark Ernst — Ernst Enterprises, LLC

#### Conflict Is the Root Of All Waste

To successfully implement change and manage the emotional mantra that bottlenecks progress, individuals must learn to identify and better address the unresolved conflict that drives waste in the first place. Behavior, not just process, is to blame for loss of productivity. Learn what makes up an organization's structures, activities, behaviors and attitudes, how employee engagement drives continuous improvement cultures and how to get to the real root of your performance pain.

Scott Gauvin — Macresco

#### Delegation Strategies to Help You be a More Effective Manager

Managing people is one of the most challenging and rewarding roles you can have, but, most managers have had little formal training for this critical role. Our teachers have been past managers or even our parents, yet these experiences typically leave us unprepared for our job. We do too much work that should be done by those who report to us. Learn proven techniques to help you be a more effective delegator.

Mark Ernst — Ernst Enterprises, LLC



#### **WEDNESDAY, NOVEMBER 11**

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

## F73: NEW! EXIT AND SUCCESSION PLANNING FOR BUSINESS OWNERS

#### Exit Planning: Preparing to Depart Your Business

Long-term preparation is essential to attaining healthy valuations at the time of a sale. Potential buyers must feel that the company has ample growth opportunities and a defensible market position. Buyers must have confidence in the financial statements, management ethics/corporate culture, and internal controls of the company. This presentation will focus on the key areas of importance to prepare to exit your business and trends and drivers of future consolidation activity in the fragmented metal forming space.

Vincent Pappalardo — Stout Risius Ross

# Own a High Value Manufacturing Company — Should You Stay, Grow or Go?

Few businesses achieve a successful sale outcome and transfers from the first generation to the second only succeed 30% of the time. Learn the business cycles and marketplace; "stay, grow or go?" business value through the eyes of a potential buyer; the dangers of owner dependence; transfer and sale options; the impact of taxes and fees; and the importance of coordinating all planning.

Kathleen Richardson — Mauro & Mauro

## How Data Analytics Can Help You Tell "Your Story"

For the business owner contemplating a future sale of his business, development of your story is critical to a successful exit transaction. Ultimately, buyers do not buy your business, they buy your story. This presentation will explore a thoughtful approach and recommendations to preparing your business for a sale through real world examples on both the buyside and sell-side of middle market manufacturing transactions.

Christopher Schumann — BKD LLP

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

# F82: NEW! WORKFORCE: MANAGING LABOR RISK AND COST

#### Effective Leadership of Contingent Technical Workers in Manufacturing

Approximately 40% of workers in the USA are employed on a contingent basis including a substantial number of engineers, technologists and technicians. Managers who utilize contingent technical workers have no formal or legal hierarchical relationship with them. However, managers often assume a leadership role in making work assignments, directing activities, evaluating work product and obtaining best performance from the contingent workers. This presentation will distinguish the difference between effective leadership practices for regular employees vs. contingent workers.

Joseph W. Lampinen — Kelly Services, Inc.

## Managing Workers Compensation Costs in Manufacturing

The increasing cost of medical expenses as a portion of a workers compensation claim is a key concern for business owners, HR directors and production managers. Proactively managing your claim costs starts with developing a culture of safety as soon as you begin to attract qualified candidates and continues through the onboarding and assimilation process. When done successfully, the impact is not only to workers compensation costs, but also to the health, safety and productivity of your workforce.

Woody Dwyer — Travelers

# F83: NEW! DIRECT SALES OR OUTSOURCING: WHICH IS BETTER FOR YOUR BUSINESS?

#### It's Not Rocket Science: Successful Sales Force Outsourcing with Independent Manufacturers' Reps

Partnering with independent manufacturer's representatives to outsource the sales function can be an obvious choice for manufacturers who want to go to market cost effectively and enjoy the benefits of local market access. What is not obvious, however, is the management strategies and tactics that maximize your effectiveness with your outsourced sales partners. Get guidance on: sales and marketing, leveraging synergistic products, partnership expectations, multi-line conflicts, and planning, pioneering and performance.

Charles Cohon — Manufacturers' Agents National Association

# Overcoming Price Buyers: Building Your Business Growth Arena

This presentation is designed for business leaders and sales professionals who often find themselves more involved in price comparison conversations with buyers, than in conversations about supplying the best solution. A commonly accepted concept; buyers don't buy until they trust. So, how do you build trust? Building trusting relationships is a process of interaction, featuring transparency that over time builds meaningful and sustainable buyer/seller associations.

Mark A. Frasco — COACT Associates, Ltd.



### 1:30 PM - 3:30 PM

# F92: NEW! CLOSING THE JOB GAP: DEMYSTIFYING RELATIONSHIPS BETWEEN EMPLOYERS AND SCHOOLS

### Demystifying Relationships Between Employers and Their Local Technical and Community Colleges

Employers want and need to establish relationships with their local community and technical colleges in order to have a reliable training and recruiting resource, but they often don't know how to get started. This presentation will focus on practical advice from the point of view of educators that will help employers take the right steps. Giving guidance on all types of training, providing insight into how to define what you need, share ideas about pre-training assessment, and how to pay for the training you need.

Kurt Billsten and Ken Ender — Harper College Nick Graff — Anoka Technical College

# F93: NEW! MARKETING STRATEGIES AND POWERFUL TOOLS TO ENHANCE YOUR PRESENCE IN THE MARKET PLACE

### Integrated Marketing Strategies to Attract Prospects to Your Brand and Drive Success

This presentation shows leaders how incorporating a series of key marketing strategies that work cohesively is proven to push organizations ahead in today's marketplace. Leaders will learn how to improve performance and drive success in their marketing programs, utilizing talents and resources already available to them. Hear core principles and initiatives designed to attract prospects to companies, brands, products and services.

Dan Gartlan — Stevens & Tate Marketing

# Dramatically Increase Your Leads with 4 Simple Website Changes

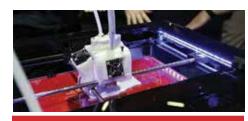
Manufacturing websites require four key elements to compel their visitors to convert. Visitors are seeking solutions to complex problems and assurance that you are the partner who will help them solve their challenges. Learn how to establish the most compelling: what, why, how, and when for your business through compelling examples of your peers.

Bill Sterzenbach — Upward Brand Interactions

### How Your Website & Social Media Can be Powerful Tools to Enhance Your Online Presence & Drive Success

This presentation offers a real-world perspective on how you can create a positive impression and maximize impact of your website and social programs. Learn proven best practices of popular social media platforms and explore specific techniques of how to use various outlets in the most effective ways for different audiences and goals.

Nicole Wagner — Stevens & Tate Marketing



### **ADDITIVE MANUFACTURING**

### **TUESDAY, NOVEMBER 10**

8:00 AM - 10:00 AM

# F48: NEW! ADDITIVE MANUFACTURING OVERVIEW FOR FABRICATORS B

### Fundamentals of Additive Manufacturing

This session will address the fundamental practices for modeling and fabricating parts with additive manufacturing, which includes the creation of a model from CAD software or 3D scanner, build file preparation and conversion and fabrication setup. Attendees will gain a general idea of activities involved in AM design practices and the fundamentals of AM.

Sheku Kamara — Milwaukee School of Engineering

# **Expanded Applications for Additive Manufacturers**

To take additive manufacturing to the next step it is essential to learn about the very latest and realistic equipment and material cost-benefit analyses taking place in industry. Furthermore, end users are being faced with new design and software rules and limitations, intellectual property issues and the difficulties associated with business case justifications. First movers will reap the benefits of the technology - and these benefits have the potential to be game changing for the businesses they disrupt.

Carl Dekker — Met-L-Flo Inc.

# Recent Advancements in Additive Manufacturing

Additive manufacturing offers a unique way to solve complex design challenges. But what does that mean for your business? This presentation will provide an overview of the recent advancements for fabricators.

Kevin Ayers — SME

### **TUESDAY, NOVEMBER 10**

10:30 AM - 12:30 PM

### F58: NEW! ADDITIVE TOOLING MANUFACTURING AIDS

### Jigs & Fixtures

Creating a jig or fixture to help reduce scrap, rework or labor is no longer cost prohibitive. Additive manufacturing can provide cost effective manufacturing aids available in days at a lower cost. The real savings come from utilizing manufacturing aids throughout inspection, production, and testing. By beginning a project with tools to maintain quality during production, manufacturing aids can reduce scrap, increase accuracy, reduce rework, and significantly speed up production.

Carl Dekker — Met-L-Flo Inc.

### Making 3D Metal Printing Work for You

An industry overview on additive manufacturing for 3D metal printing will be discussed. Specific examples will be shared from prototype and production parts, various available metals, sizes, shapes and geometries of parts and potential applications for jigs and fixtures. Case studies on metal part and material development will be presented as well.

Bob Henderson, Linear Mold & Engineering

### **Fundamentals of Laser Metal Deposition** and It's Applications

Additive manufacturing is a hot trend that is discussed amongst many industries. With 3D printing of metals not yet ready for regular production use, the available and established process using metal powder is LMD, Laser Metal Deposition. This process is used in a broad range of applications including adding hard wearing coatings as well as repair work and structure buildup. Compared to other additive manufacturing methods it offers superior accuracy and quality. This presentation will introduce the process basics, capabilities and limitations and the required equipment to newcomers in the additive manufacturing world.

Frank Gever — TRUMPF Inc.



JOB SHOP SOLUTIONS

### MONDAY, NOVEMBER 9

8:00 AM - 10:00 AM

F14: NEW! MANUFACTURING **EXECUTION SYSTEM (MES)** TECHNOLOGY: EXPLAINED [A]

### Bringing the Shop Floor into the 21st Century

The Internet and newer computing technologies have driven significant changes in customer expectations for immediate gratification and cheaper products. These expectations are changing the way manufacturers operate, putting a demand on improving supply chains, increasing speed to market, and reducing costs. To be competitive, manufacturers must embrace digital technologies on the shop floor. This presentation will show manufacturers how to leverage 21st century manufacturing execution system (MES) solutions on the shop floor for a competitive advantage.

Ann Krauss and Richard Reith — Paper-Less

### Completing the "Lifecycle of Data" with Manufacturing Execution System (MES) Technology

This presentation will help you understand how to build on the "Lifecycle of Data" and understand how different manufacturing execution systems (MES) fit into that lifecycle. We will illustrate the contributions of each type and what environments each type may fit best, which will allow you to align expectations to the results those systems can deliver. Gaining this insight will help build one database rather than perpetuate the never ending silos of data to bring real business value and help contribute to your continuous improvement initiatives.

Ann Krauss and Mike LeRoy — Paper-Less

10:30 AM - 12:30 PM

### F24: NEW! COST REDUCTION STRATEGIES FOR JOB SHOP III

### **Cost Reduction Strategies**

This presentation will show business owners how to operate and manage their business via the 'Check Book Approach.' This approach requires that business owners know the true costs of the products and/or services that they provide. When an owner knows this, they can target resources on the specific areas where cost reductions gain ground for business stability and growth.

Alan Lund — CORE Business Management Solutions







# Proven Shop Floor Cutting Techniques for Bottom-Line Improvement

The shop floor represents a manufacturer's best opportunity for bottom-line savings: better machinery utilization, inventory management and manpower productivity. This presentation will present proven methods for increased fabrication productivity, part quality, and cost savings by the reduction of scrap and consumables.

Scott Grindstaff — SigmaTEK Systems, LLC

# Scrap Management: Are You Maximizing Revenue?

This presentation will guide you through the questions you need to ask about how your operation handles scrap management. Learn how scrap is generated in the facility, how to manage it internally, selecting scrap vendors, upgrading materials and understanding pricing of ferrous and non-ferrous metals.

Thomas Romer — Worthington Industries

### 1:30 PM - 3:30 PM

# F34: NEW! IMPROVING YOUR "BOTTOM LINE" WITH BETTER ESTIMATING, JOB COSTING AND SCHEDULING

### Estimating, Job Costing and Scheduling

This presentation will investigate the estimating process in a made to order manufacturing environment, learning how to analyze shop resources for scheduling purposes and how to apply those resources within the shop effectively.

Phillip Sofield — MIE Solutions, Inc.

# Activity Based Costing for Job Shops — It's as Easy as A-B-C

Understanding the true cost and conducting a thorough financial analysis of your orders can seem overwhelming at times. This presentation will help you break down the process to fully understand the cost lifecycle of your orders from quote to shipping including analyzing the true profitability of your orders using activity based costing.

David Lechleitner — Exact Online

### **TUESDAY, NOVEMBER 10**

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

# F44: NEW! STRUCTURAL FABRICATION 101

### Structural Fabrication: How to Grow Your Business

Learn the basics of structural fabrication and how it can benefit your operation including: return on investment justifications, design/software trends in fabrication and get your questions answered.

John Cross — American Institute of Steel Construction

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

# F54: DESIGNING PARTS FOR SHEET METAL

### **Designing Parts for Sheet Metal**

Personnel that design, program and manufacture parts must understand their equipment capabilities and machine limitations. This presentation will change the way a designer thinks about the part design process from start to finish. New designs must be innovated from the start and keep the end goal in mind to reduce costs.

Grant Hagedorn — TRUMPF Inc.

### 1:30 PM - 3:30 PM

# F64: NEW! PRODUCT TRACKING FOR THE JOB SHOP

# Traceability and Serialization in a Connected Enterprise

This presentation will explore connecting direct part marking with the rest of the factory to achieve full traceability. The technologies discussed will include laser and dot peen marking systems and communicating that equipment directly with a programmable logic controller (PLC) or PC, integrating to the manufacturing floor and enterprise software, in order to transmit or receive traceability information. In both environments, the communication protocols can vary depending on manufacturing systems.

Dave Sweet — MECCO

### Cost Savings by Utilizing Metal Tag Systems for Tracking Production; Overcoming the Hurdles and Realizing the Benefits

This presentation will document the ease of use for a metal tag system, various methods to attach the tag to the fabrication, and field test results of tags that have been painted or galvanized. Tags may be created without manual input of data thus eliminating the human error factor. Software interface will be reviewed as well as support options.

Robert Speer — InfoSight Corp.

### WEDNESDAY, NOVEMBER 11

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

# F74: NEW! STRUCTURAL FABRICATION TECHNOLOGY I

### Structural Fabrication Technology

Learn more about structural fabrication with three OEM Machine Tool presenters, demonstrating the benefits of adopting structural fabrication in your operation through a presentation followed by a tech tour on the show floor.

Speaker TBD — Peddinghaus Corp. Pierre M. Geoffrion — StruMIS LLC Speaker TBD



### WEDNESDAY, NOVEMBER 11

10:30 AM - 12:30 PM

F84: NEW! METALLURGY 101 🖪

### Metallurgy 101: Basics of Flat-Rolled Steel

This presentation will focus on the steelmaking processes, including the basics of flat-rolled steel processing typically provided by service centers. Discover options to address challenges encountered with materials you work with on a regular basis.

Ben Reed — Worthington Industries

### Aluminum Metallurgy

This presentation discusses the different families of wrought aluminum alloys, the distinguishing features between the families, the metallurgical factors that influence their mechanical properties, and how the mechanical properties are modified by alloying, cold-working, and heat treatment.

Michael Pfeifer — Industrial Metallurgists, LLC

1:30 PM - 3:30 PM

### F94: NEW! IMPROVING **ENVIRONMENTAL WORKING** CONDITIONS IN THE JOB SHOP [3]

### Drop the Mop: Using Air Movement to Fight Condensation

Condensation occurs when cold surfaces meet warm, moisture-laden air. The National Association of Corrosion Engineers (NACE) states that corrosion from rust costs the production and manufacturing sectors \$17.6 billion annually. Learn how to "Drop the Mop" using air movement to fight condensation saving your operation money, alleviating product loss, and creating a safer working environment.

Mike Robinson — Big Ass Solutions

### Dollars and Sense: Smart Lights, Operational Visibility and Cold Hard Cash

The market is rapidly moving to LEDs that offer long lifetimes and dramatic energy savings. While plain LED fixtures provide wattage savings, intelligent LED systems deliver efficiency, operational visibility, faster payback, and better ROI. This presentation will dive into the business case for upgrading to intelligent LEDs - including landmark study data - and the benefits of optimizing your facility.

Aaron Kless — Digital Lumens

### Safety and Security by Design

This presentation will educate you about security. Gain knowledge to make a value analysis to properly design a solution that meets your customer's requirements. Learn how locks work and see how the technologies prevent picking and maintain access control. Regardless of your end product, you'll leave understanding the safety and security risks of the product you designed and built.

Tom DiVito — Camlock Systems Inc.

### **THURSDAY, NOVEMBER 12**

8:00 AM - 10:00 AM

### F104: NEW! MAKING A BUSINESS CASE FOR SAFETY 🖪

### Making a Business Case for Safety

To sit at the decision-making table, the safety professional has to change the language they use with management and how they align themselves with the organization. They must speak the language of profit margins, productivity, quality, return on investment, return on equity and not of compliance issues. Learn how to better position the safety professional to become a revenue generator and not a cost of doing business.

Brian Roberts — CNA Risk Control



### **AUTOMATION**

### MONDAY, NOVEMBER 9

8:00 AM - 10:00 AM

F15: NEW! MAXIMIZING YOUR ERP **SCHEDULING TOOLS** 

### Maximizing Your ERP Scheduling Tools: Every Job On Time

Leading ERP vendors from FMA's Software Technology Council of volunteers will discuss scheduling issues and present successful case studies. Ample time will be provided for Q&A pertaining to scheduling and ERP software in general.

David Lechleitner — Exact Online Christine Hansen — Epicor Software Corp. Bob Radder — KeyedIn Solutions, Inc. Adam Grabowski — Global Shop Solutions

10:30 AM - 12:30 PM

### F25: NEW! THE CONNECTED **ENTERPRISE: BRINGING THE**

### DATA TOGETHER III

### How the Cloud is Changing the Business of Manufacturing

This presentation discusses the powerful technology known as "the cloud" that allows a manufacturer to be more efficient and competitive. The primary drivers of a move to the cloud include cost control, end-to-end process visibility and anytime, anywhere access to critical business information. Learn how a new technology removes formerly rigid bounds of functionality that made traditional ERP solutions complex, difficult to use and not widely adopted by company employees.

Lauri Klaus — KevedIn Solutions, Inc.







### The Benefits of Shop Floor Machine Monitoring

The benefits of manufacturing data collection are numerous including reduced downtime and increased efficiency. This presentation will explain the successes of MTConnect in the CNC environment and the current movement into fabrication. Learn how data can be collected using a variety of hardware devices as well as best practice methods of implementation and how to utilize the data.

Josh Davids — Scytec Consulting Inc.

# Improving Productivity Through User Interface Design: A Case Study

This presentation will examine the role of proper User Interface (UX) design, so as to make normal operation, resetting of faults and maintenance very intuitive. UX design allows for a smooth interaction from a single device regardless of the application being used. Learn how a company distributing consumer products with revenue in excess of \$9 billion has standardized operations through six different distribution centers thanks to a focused approach on UX design.

Rob Dolci — Aizoon USA

### Software for Highly Efficient Production

Smarter machines, cloud solutions and big data are just a few examples of how software is driving innovation. Software plays a key role in the future of manufacturing. The optimal solution is software complimenting the hardware in order to best utilize your machine. The goal is to be more efficient and productive by automating as many programming steps as possible. The requirements of software which can help with your product design, machine programming and your production planning will be discussed.

Steffen Kutz - TRUMPF Inc.

### 1:30 PM - 3:30 PM

# F35: NEW! AUTOMATION APPLICATION STRATEGIES FOR PRODUCT MIX

### Leveraging Lean for High Product Mix Environments

Today's fabrication shops are complex. Shared resources, high product mix, scheduling problems, and unstable customer demand make it challenging to run a mix of products through the same value stream. This presentation takes the lean concepts of value stream mapping to the next level and provides a step-by-step approach for designing mixed model value streams for these complex environments.

Kevin Duggan — Institute for Operational Excellence

### **MONDAY, NOVEMBER 9**

### 1:30 PM - 3:30 PM

# Automation Strategies for High Mix/Low Volume Applications

Robotic automation has historically not had a place in High Mix/Low Volume shops due to the time and money spent programming and outfitting an extensive portfolio of parts. However, recent innovations in technology, design, and software have enabled robotic solutions to be relevant in these applications. This presentation seeks to demonstrate strategies that make robotics a viable solution for High Mix/Low Volume fabricators.

Josh Pawley and Lance Guymon — Wolf Robotics, LLC

### WEDNESDAY, NOVEMBER 11

8:00 AM - 10:00 AM

F75: NEW! AUTOMATING THE SHOP FLOOR II

### Make it Better, Keep it Better - The Short and Long Term Benefits of Automatically Collecting OEE Data

This presentation delves into the design and implementation of a robust real-time automated Overall Equipment Effectiveness (OEE) data collection system. The key to getting timely, accurate, and unbiased data is to collect as much information as possible automatically. Automated OEE collection systems provide immediate benefits by identifying the leading causes of waste, allowing you to focus your process improvement resources where they can best impact efficiency.

Keith Magnant — ShopFloorConnect

# Automating the Shop Floor with Just-in-Time Nesting

Just-in-Time nesting is ideal for any sized company running a due date driven manufacturing process. Whether you are a small company running one machine or a large company with lots of machines, we can size the solution to fit your needs. This presentation will discuss how manufacturers can move nesting operations from the office to the shop floor.

John Leuzinger — SigmaTEK Systems, LLC

### Toward the Smart Factory Concept

This presentation focuses on how to transition any manufacturing operation into a high efficiency, high flexibility "smart factory" with the latest tools available. New technologies to measure and modify processes to increase productivity, quality and profitability of operations will be reviewed. This includes reviewing a means to analyze and manage cutting/welding quality through software integration with order management systems to achieve end-to-end data flow.

Holger Hahn — ESAB Welding & Cutting Products

### WEDNESDAY, NOVEMBER 11

10:30 AM - 12:30 PM

F85: NEW! MODERNIZING
MAINTENANCE AND INSPECTION

# Innovations in Automated Surface Inspection at Full Processing Speeds

Metal Service Centers can greatly maximize their slitter line throughput and slitter quality metrics by moving from a manual process to an automated surface quality inspection system. Critical disposition decisions about each mult and/or coil can also be made in just a few minutes, and real-time surface quality data is easily acquired through an Andon display, streaming video, or surface quality alerts on your smartphone. All this data can be reviewed, fine-tuned, archived or sent instantaneously to all stakeholders to ensure higher quality outcomes while avoiding costly re-runs or waste.

Darin Cerny — Cognex Corp.

# Machine Monitoring and Data Collection for Maintenance Optimization

Learn how your organization can capitalize on cloud solutions for better asset management and utilization and more efficient, effective operations. This presentation will give real-world examples of the benefits so you can see how high your utilization and asset management strategy can soar.

Paul Lachance — Smartware Group, Inc.

### Zero Down Time: Maximizing Productivity

Good process control requires systematic data collection and analysis. To date, this has been a laborious task and many times produces immeasurable results, making it difficult to quantify. Predictive maintenance is now achievable through accurate mathematical models of the robot and process equipment allowing customers to tailor their maintenance schedule and maximize productivity.

Michael Sharpe — FANUC America Corp.





### **FORMING & FABRICATING**

### **MONDAY, NOVEMBER 9**

8:00 AM - 10:00 AM

F16: PRESS BRAKE SAFEGUARDING: CHANGES TO ANSI B11.3

# Press Brake Safeguarding: Changes to ANSI B11.3 — 2012 Explained

Get a better understanding of the new ANSI B11.3-2012 Press Brake Safety Standard and its dynamic changes. Real world examples will outline an application appropriate approach to defining which type of safety device - light curtain, laser, or camera system maximizes part flow through a particular machine.

Douglas Raff — Paragon Industrial Controls, Inc.

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

# F26: TOOLING SOLUTIONS FOR METAL FABRICATORS

# Setting Yourself Up for Success: Dealing with Failures & Changing Your Future

Learn what it takes to have a successful fabrication operation. Eliminate costly tooling failures by gaining valuable tips and tricks. Boost your overall production by incorporating some under utilized tools/forms.

Jeff Paulson — Wilson Tool International

# Emerging Press Brake Tooling Techniques that Maximize Productivity & Reduce Cost

As press brakes become more advanced, it is imperative that fabricators be equipped with tooling systems that take full advantage of the available technology. Learn about the latest advancements and how they can be utilized to minimize tooling costs and maximize press brake productivity.

David Bishop — Wila USA

### Tooling Solutions and Processing Parameters Designed for Stamping and Forming Advanced High Strength Steels

This presentation will offer recommendations for tool steel grades and process parameters required for the forming and stamping of different types of advanced high strength steels. The recommendations are based on experimental testing that was performed in the laboratory as well as validation tests conducted with actual production tooling.

James Kaszynski — Böhler Uddeholm Corp.

### 1:30 PM - 3:30 PM

# F36: MAXIMIZING YOUR ROLL FORMING OPERATION [3]

### Why Roll Forming?

This presentation highlights the versatility of roll forming and its use in multiple markets because the process enables many other metal forming processes to be integrated into it to create a value-add opportunity. This reduces the manufacturing cost, which in turn allows for the customer to get the product at a much lower cost.

Brian Rodgers — Roll Forming Corp.

# Add Value to New or Existing Roll Forming Lines with "In-line Punching and Cut-off Solutions"

This presentation will explain and show examples of completely integrated roll forming lines, showing the cutoff and punching operations that are performed to produce finished parts from the line. This starts from simple cutoff methods to applications with holes, slots, notches and cutting the part to length using different methods of dies, presses and measuring systems.

Paul Williams — Hill Engineering/Formtek, Inc.

### **TUESDAY, NOVEMBER 10**

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

### F46: PRESS BRAKES FOR ENGINEERS II

Ever wonder how an air-bend radius turns sharp at 63% of the material thickness? This presentation will answer just that. Learn where this number comes from, the effects operationally and the development of a correct flat pattern.

Steve Benson — ASMA LLC

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

### F56: ADVANCEMENTS IN COIL SLITTING 💵

### Brain Surgery with a Bulldozer: The Art & Science of Slitting

This presentation highlights the basics of coil slitting through real examples to illustrate everyday problems and solutions. Understand the proper way to determine horizontal and vertical clearances, reduce knife and arbor deflection, how to choose the right size rubbers, sources of knife chipping and how to minimize tooling damage.

James Wilcox — International Knife & Saw

### Latest Advances In Coil Slitting Technology

This presentation will delve into the use of AC Drives for best control of the strip, robotic slitter tooling and robotic separator tooling, quick change slitter head setup, and slitting line guarding to enhance line operation.

Peter Swenson — FIMI Machinery SpA

### Overcoming the Challenges of Slitting High Strength Steel

Old slitting practices are no longer working on today's advanced metals. Gain a better understanding of the ways in which you can successfully slit advanced high strength steel and other challenging metals.

Al Zelt — ASKO, Inc.

### 1:30 PM - 3:30 PM

# F66: BENDING OPTIMIZATION SOLUTIONS ■

### **Automating the Bending Process**

Learn how to incorporate different levels (programming, tool changing, part handling, etc.) of bending automation into your current fabrication process. This presentation will include case studies and a cost justification process to help determine what level of automation is right for your company.

Scott Ottens — Amada America, Inc.

# Bending vs. Folding: Finding the Right Technology for Your Application

Choosing the right technology for forming a part can be tricky. There are press brakes and panel bender technologies in the forming world, but which is better suited for your application? In this presentation, learn what makes a good press brake part and which lends itself better to a panel bender. James Crandall — TRUMPF Inc.

### **Understanding Modern Press Brakes**

This presentation will cover the recent evolution of ram drive systems, back gauge drive systems and crowning drive systems. In addition, tips on reducing setup times to increase capacity, availability, and maintain pace with high-speed bending will be shared.

Paul LeTang – Bystronic, Inc.

### WEDNESDAY, NOVEMBER 11

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

F76: NEW! OPERATIONAL PRESS BRAKES: THE FOUR PILLARS OF

### TONNAGE 🔢

# Operational Press Brakes: The Four Pillars of Tonnage

Learn the four essential steps of working with a press brake that will allow you to never deal with a damaged press brake again. Discover how to calculate the forming tonnage the job requires, identify your tooling load limits, calculate the sinking tonnage limit, and calculate the press brakes load limit.

Steve Benson — ASMA LLC

### WEDNESDAY, NOVEMBER 11

10:30 AM - 12:30 PM

### F86: NEW! IMPROVING YOUR OPERATION WITH LUBRICANTS [3]

### Modern Lubricants for Roll Form Processes

Learn about the different types of lubricants and coolants used in roll forming. This presentation will offer a methodical way to select the best lubricant for each process. The latest technologies, coolant application and monitoring will be discussed.

David Kinnard — Tower Oil & Technology Co.

### Improving Lean Manufacturing Though **Process Lubricants**

Fluid systems that recirculate lubricants and coolants are dynamic, requiring attention and maintenance. Failure to properly clean and balance fluid systems may lead to increased scrap rates, decreased system tooling life, more downtime due to tooling changeovers and diagnostic needs, and poor part cleanliness. This presentation will highlight the ways in which metalworking fluids may be used to their fullest, cost effective potential.

Gardner Tripp and Bill Coode — Etna Products, Inc.

### 1:30 PM - 3:30 PM

### F96: OPTIMIZING PRODUCTION ON YOUR PUNCHING MACHINE III

### **Optimizing Production on Your Punching Machine**

One of the challenges that modern manufacturers face is how to meet their ever increasing production demands while ensuring they reach the maximum potential of their equipment. The ultimate goal is to produce the most parts per day. Learn how these modern fabricating machines can accomplish such tasks thanks to advances in drive technology, machine capabilities and control software.

Brian Welz — TRUMPF Inc.

### Managing Production Loads & Increasing **Processing Times**

Software products today have come a long way in their ability to monitor and increase production efficiencies. High end machine tools with matching purchase prices need to be kept busy. Increasing machine productions, understanding why machines are running or not, load balancing and other aspects of manufacturing can use software tools to improve in all these areas.

Rick Dorman — Murata Machinery USA, Inc.

### **THURSDAY, NOVEMBER 12**

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

### F106: MAKING FLAT PARTS: LEVELING **SOLUTIONS B**

### **Basic Concepts of Leveling Metals**

This presentation dives into the basic concepts of roller and stretch leveling including an introduction to metallurgy of metals, giving you a greater understanding of the leveling process. The geometry of defects and quantification methods will also be discussed.

Thomas Hazen — T. F. Hazen Consulting

### Innovations in Roller Leveling

Using tension during leveling creates stress free, laser flat material. Understand how the latest technology helps measure flatness by monitoring the material surface and equalizes internal stresses by using an automatic leveler adjustment to prevent low bow in a cut-to-length line.

Brownie Cox — The Bradbury Co.

### Making Parts Flat: Innovations in Part Leveling

What's the difference between parts leveling and leveling coil? This presentation will discuss and evaluate the unique characteristics faced when leveling parts and how these challenges need to be addressed. Learn how to improve flattening processes and provide customers with better products.

Nicholas Miller — ARKU Coil Systems





**TUBE & PIPE** 

### WEDNESDAY, NOVEMBER 11

8:00 AM - 10:00 AM

### F77: TUBE PRODUCTION II

### Chemical Welding Using Structural Adhesives for Pipeline Assembly & Repair

Qualified welders for pipeline assembly and repairs are becoming rare. Chemical welding is a means of supplementing traditional welding skills using structural adhesives and welding together to increase throughput, strength, and longevity. Several case studies will be presented to educate attendees on the benefits and limitations of this technology.

Ross M. Zambanini — LORD Corp.

# ODF Technology of Pipe Forming Using Steel Plate as Raw Material

Learn about an innovative ODF (Orbital Die Forming) technology developed to produce steel pipes using both steel strips and steel plates as raw materials in a continuous production style. By applying this new forming process, typical issues involved in roll forming can be avoided, unsteady forming areas can be reduced and production of pipes runs more efficiently in high material yield.

Iwao Nakata — NAKATA MFG. CO., LTD.

### ID & OD Scarf Chopping for the Tube & Pipe Producers of Mechanical & Structural API Pipe

Safety comes first in the tube and pipe industry. To keep up, advancements and enhancements are being made in ID and OD Scarfing on a regular basis. Learn about the latest designs that allow operators to maintain a safe distance from the ID or OD Scarf, developments in stand and bar designs, and specialization in the ID and OD Scarfing and chopping equipment.

Dan Ventura — Ventura & Associates

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

### F87: BENDING TUBE

### Mind the Lube Gap - Selecting the Right Lubricant for Your Tube Bending and Forming Applications

Tube benders and end formers are mindful of the gap between the tube and the tooling. Determine the best lubricant for your process through friction evaluation tools and industry best practices. Modern lubricant regimes and real world case histories will be discussed as well as time for individual focus on attendee processes.

Christopher Fletcher — Tower Oil & Technology

### **Tube Bending Technologies - The Basics**

Get back to the basics with an overview of the different techniques available in tube bending. Gain a better understanding of the bending process and get guidance on improved production at a lower operating cost.

Dan Jacobs — SigmaTEK Systems LLC

### 1:30 PM - 3:30 PM

# F97: **NEW!** TESTING AND INSPECTION OF TUBE AND PIPE **II**

### Ultrasonic Testing of Tubes Without Liquid Coolant

Ultrasonic Testing (UT) is the alternative of choice for volumetric defect detection and thickness measurement in tubes. However, the need to use a liquid coolant to transmit the sound restricts the applications and limits their attractiveness in production environments. Non-contact ultrasonic techniques such as Electro Magnetic Acoustic Transducer (EMAT) and Dry-Coupled UT (DCUT) are rapidly gaining popularity as the cost of the technology goes down, and they prove their validity in meeting the most demanding UT codes. In this presentation understand the latest results in ERW inspection, surface inspections and thickness measurement using non-contact EMAT and Dry-Coupled UT sensors.

Borja Lopez — Innerspec Technologies

### QUESTIONS?

For registration assistance, please contact 508-743-8544 (Monday - Friday 9AM - 5PM ET) or FABTECH@Xpressreg.net.

For general show information, please contact us at information@fabtechexpo.com.

### **SEMINARS**



### **MONDAY, NOVEMBER 9**

### 8:00 AM - 12:00 PM W10: D1.5 CODE CLINIC

This 4-hour seminar will help you prepare for the AWS D1.5 Bridge Welding Code exam by instructing in code navigation, structure, and design. The seminar will focus on areas of the code relevant to the welding in spector, specifically clauses and sections concerning materials and design, fabrication, inspection, and qualification. Note that endorsements are supplemental inspection credentials available to AWS Certified Welding Inspectors (CWIs) and Senior Certified Welding Inspectors (SCWIs), but non-CWI/SCWIs can also participate in the seminar and examination to expand their professional credentials. Please note that there is a separate application and fee required to take the Certification Exam.

**NOTE:** Clinic fee does not include a copy of AWS D1.5M/D1.5:2010 Bridge Welding Code. AWS D1.5M/D1.5:2010 Bridge Welding Code book can be purchased from WEX at (888) 935-3464.

### **MONDAY, NOVEMBER 9**

### 1:00 PM - 5:00 PM

### W11: API 1104 CODE CLINIC

This four-hour course covers general code provisions, including qualification of welding procedures for welds containing filler metal additions, design and preparation of the joint for production welding, nondestructive testing and acceptance standards, and automatic welding with and without filler metal additions. Attendees will practice open codebook testing under time constraints.

**NOTE:** Clinic fee does not include a copy of API 1104, Welding Pipelines and Related Facilities (20th Edition). API 1104 may be purchased from WEX at (888) 935-3464. Attendees will receive our study guide, AWS API Code Clinic Reference Manual.

### **MONDAY, NOVEMBER 9**

### 8:30 AM - 4:30 PM

### W12: D1.1 - CODE CLINIC

The one day seminars will provide a "road map" through the Code, emphasizing the ability to locate important paragraphs, charts and tables quickly, which is crucial to understanding the code when working under stressful deadlines. In addition to practice questions, a practice exam will be administered, and the instructor will illustrate the use of the Code under time constraints, creating deadline pressure similar to the test environment. If you're taking the CWI exam., this clinic has proven to be valuable test preparation. As a leading construction code, D1.1 is the ideal tool to teach effective code use.

**NOTE:** Clinic fee does not include a copy of the D1.1/D1.1M: STRUCTURAL WELDING CODE-STEEL. D1.1 Code Book may be purchased from WEX at (888) 935-3464. Attendees will receive our study guide, AWS D1.1 Code Clinic Reference Manual.

### **MONDAY, NOVEMBER 9**

# THE WHY AND HOW OF WELDING PROCEDURE SPECIFICATIONS

W13: Beginner – 8:00 AM – 12:00 PM W14: Advanced – 1:00 PM – 5:00 PM W15: Beginner and Advanced – 8:00 AM – 5:00 PM

### Welding Procedure Specifications — Ensuring Consistent, Predictable Welding Processes Performance

As a welding professional who is constantly responding to customer demands for increasing the performance and quality of weldments while controlling costs, optimizing your WELDING PROCEDURE SPECIFICATIONS (WPSs) for performance and profitability SEMINARS may be the key. A well written WPS Defines, Measures, Analyzes, Improves, & Controls (DMAIC) quality in the welding process. This two-part workshop revisits the fundamentals of WPSs for both the seasoned professional and for those individuals seeking to become more proficient in the authoring and application of a WPS in fabrication as well as a hands on approach to advanced instruction in the formulation and writing of WPSs.

### Who should attend:

This session will benefit owners, managers, engineers, and CWIs who must qualify, write, or revise welding procedure specifications to satisfy codes and contract documents.

### What will be addressed?

This workshop is divided into two half day sessions. The morning session addresses the fundamentals of WPSs. Morning topics are focused on:

- Standard terminology
- Welding processes
- Filler metal
- Shielding gases
- Current and voltage range, travel speed and heat input
- Joint design tolerances
- Joint and surface preparation
- Preheat / interpass temperature and welding positions
- Standard WPSs

The afternoon session focuses on the mechanics of WPSs by different codes and standards. Afternoon topics include:

- Proper preparation and qualification of welding procedure specifications
- Documenting standard procedure qualification testing for commonly used processes for joining ferrous plate and pipe
- Selecting and documenting welding variables
- Specifying essential and nonessential variables commonly used in sample AWS, ASME, and API code formats
- Different techniques to author WPSs

### **SEMINARS**

### TUESDAY, NOVEMBER 10

### 8:30 AM - 4:30 PM

# W16: CRASH COURSE OF WELDING INSPECTION TECHNOLOGY (WIT)

This one day seminar is designed to combine the normal three day WIT (Fundamentals) portion of the CWI seminar into a one day crash course. The intent is to breakdown and cover the common knowledge aspects as opposed to covering all ten Chapters of the Welding Inspection Technology (WIT) textbook/workbook.

### **TUESDAY, NOVEMBER 10**

### 8:30 AM - 4:30 PM

# W17: WELDING SYMBOLS — WHAT YOU THINK THEY MEAN AND WHAT THEY ACTUALLY MEAN

Welding symbols are a great communication tool but are quite often misunderstood. While a designer typically knows what weld joint or weld they want, the welding symbol they place on a drawing is often either drawn incorrectly or is misinterpreted by the welder making the weld. Furthermore, many welding inspectors do not fully understand welding symbols and may be misinspecting welds. The goal of this seminar is to provide a good understanding of AWS welding symbols, with explanations of their proper and improper use. This seminar is geared for all involved with welding symbols — from designers who place them on drawings, to the welders who know what the designer wants (regardless of what the symbol says), to the welding inspector who has to verify that the final weld meets the welding symbol requirements. It will also be great for new engineers who do not have the experience with symbols, shop and field supervisors, and anyone else involved in manufacturing and welding. Examples of welding symbols which frequently trip up users and real-life samples are provided.

### Books for AWS to provide:

- AWS A2.4:2012 Standard Symbols for Welding, Brazing, and Nondestructive Examination
- AWS A3.0M/A3.0:2010 Standard Welding Terms and Definitions

# TUESDAY, NOVEMBER 10 - WEDNESDAY, NOVEMBER 11

### 8:30 AM - 4:30 PM

### W18: ASME SECTION IX, B31.1 & B31.3 CODE CLINIC

This 16-hour seminar will help you prepare for the ASME Section IX, B31.1, and B31.3 examination for endorsement or Part C of the CWI. Note that endorsements are supplemental inspection credentials available to AWS Certified Welding Inspectors (CWIs) and Senior Certified Welding Inspectors (SCWIs), but non-CWI/SCWIs can also participate in the seminar and examination to enhance their educational background. Participants are expected to provide their own codebooks. Please note that there is a separate application and fee required to take the Certification Exam.

### WEDNESDAY, NOVEMBER 11

### 1:00 PM - 5:00 PM

W19: CORROSION OF WELDS: CAUSES AND CURES

### Corrosion in Welded Metallic Systems

Corrosion, resulting in the severe degradation of materials, is one of the most expensive engineering problems in our industrial society; estimates have been made that the annual cost of corrosion in the U.S. exceeds 100 billion dollars. Welded structures are often subjected to corroding environments; in some cases, the weld and base metal corrode uniformly at the same rate. In other cases, the results are accelerated corrosion of the weld compared to the base metal, or the base metal may corrode at a much faster rate leaving the weld metal relatively intact. A logical starting point for dealing with corrosion of welds is to define corrosion and then list the various types of corrosion that can occur, with examples. There are many different forms of corrosion recognized and various corrosion mechanisms. The most common of these will be covered in the course.

### Who Should Attend:

This session will benefit owners, managers, engineers, and inspectors who must monitor, inspect, prevent, and repair weldments in corrosive environments.

### What will be addressed?

This course will begin by addressing the fundamentals of corrosion. Other topics to be examined include:

- Pitting corrosion
- Inter-granular corrosion
- Stress corrosion cracking
- Erosion/corrosion
- Crevice corrosion
- Galvanic corrosion
- Alloying for corrosion resistance
- · Corrosion protection mechanisms

### WEDNESDAY, NOVEMBER 11

### 8:30 AM - 4:30 PM

### W20: VISUAL INSPECTION WORKSHOP (VIW)

An 8-hour course for CWI exam candidates to review the basic concepts and applications of visual inspection. After a discussion of the limitations and advantages of visual inspection, types of weld data that may be obtained by visual inspection are presented and discussed. Includes the many types of discontinuities encountered during the visual inspection of welds. Common tools used for visual inspection are presented and discussed (a machinist's scale, dial calipers, micrometers, fillet weld gages, the Palmgren gage, and the V-WAC). Participants will use these gages to make measurements on weld replicas. This will prepare candidates for Part "B" of the exam.. A sample weld specification containing acceptance criteria is presented and discussed, after which students use the specification and visual inspection tools to evaluate the weld replicas using a series of specific questions and scenarios.

### **SEMINARS**

### **WEDNESDAY, NOVEMBER 11**

### By attending you can learn:

- How to use weld-measuring instruments
- Compliance to a specific code
- Do's and don'ts of documentation
- When a discontinuity is OK
- When a defect is rejectable
- Why visual inspection can be the most effective NDE technique

### WEDNESDAY, NOVEMBER 11

### 8:30 AM - 4:30 PM

# W21: PREVIEW OF THE NEW PART B WELDMENTS

Beginning January 1, 2016 the Certification Department will be unveiling a new Part B for the AWS CWI tests. This course is intended to give you a glimpse of what the new Part B plastic replicas are like, these plastic replicas will be the same one's used in our AWS CWI Seminar's. This course will give you a perspective of the new plastic samples for educational purposes only. There will be no videotaping and photographing during the seminar due to the sensitivity of the material. All material handed out will be collected at the end of the seminar.

# WEDNESDAY, NOVEMBER 11 - THURSDAY, NOVEMBER 12

8:30 AM - 4:30 PM

**WELDING OF STAINLESS STEEL** 

W22: Part 1 - The Basics

### W23: Part 2 - Avoiding Weld Defects

This seminar has two independent parts: Part 1 – The Basics and Part 2 – Avoiding Defects. Register for either day alone or for both days. The program focuses on the basic weldability of all types of

stainless steels. This session is key to those interested in a comprehensive look at the weldability of stainless steels, particularly the 300 series.

### **Topics Covered:**

- Why alloys are "stainless"
- Stainless steel differences
- Selecting a stainless for use
- Mechanical properties
- Properties after welding
- Heat treatment factors
- Selecting filler metals
- · Gas vs. flux shielding
- Code requirements

### Those attending can learn:

- Five stainless steel types
- The effects of welding on all types of stainless steels
- Why some stainless steels require preheat and others prohibit it
- Answers to questions about selecting and welding stainless steels

### THURSDAY, NOVEMBER 12

8:00 AM - 3:00 PM

# W25: METALLURGY APPLIED TO EVERYDAY WELDING

Metallurgy of welds in carbon and low-alloy steels shouldn't be complicated. This short course will help you understand how welding affects the properties of base materials, and how weld defects occur.

### Who should attend:

Owners, inspectors, engineers, and supervisors who specify welding and need to understand the interactions of base, filler, and welding processes should attend.

### **CONFERENCES**

# TUESDAY, NOVEMBER 10 - WEDNESDAY, NOVEMBER 11

8:00 AM - 5:00 PM

W26: SO YOU'RE THE NEW WELDING ENGINEER

How to get "up to speed" quickly, ask the right questions, and get the results needed to save money and stay out of trouble! Two-Day Conference for Managers/ Engineers/Designers, and others with welding responsibility but limited exposure/background in welding. The session is based on arc welding applications but the principles have universal applicability. Presentations and discussion are based on the "Application Analysis Worksheet," which was developed to teach a senior college course to engineers about to enter industry, with the objective of helping them develop a path to understand and deal with the challenges they were about to face.

### DAY 1 - TUESDAY

8:00 AM - 8:30 AM Welcome and Introduction

### 8:30 AM - 10:00 AM The Application Analysis

Fritz Saenger — Consultant

### 10:00 AM - 11:00 AM Key Background Information

Walter Sperko — Sperko Engineering Services, Inc.

11:00 AM - 12:00 PM

"Matching" the Base Materials and the Weld

Tom Myers — Lincoln Electric

12:00 PM - 1:00 PM - Lunch

1:00 PM - 2:00 PM Pre and Post Weld Operations

Mike Rice — Nooter Corp.

2:00 PM - 3:30 PM

Arc Welding Process Modes – What Are You Using? What Are "Advanced" Modes? Would You Benefit from "Advanced" Equipment and Techniques?

Nino Mascalco — ESAB Welding & Cutting

3:30 PM - 4:30 PM The Welding Procedure

Lee Kvidahl — Ingalls Shipbuilding

### **CONFERENCES**

4:30 PM – 5:00 PM

Making Your PROCEDURE Robust: Controlling the Critical Parameters

Dennis Harwig — American Welding Society

### DAY 2 — WEDNESDAY

8:00 AM - 9:00 AM

Weld Quality — Requirements of Different Types of Applications: Commercial, Military, Industry, etc. Dick Holdren — Arc Specialties

9:00 AM – 10:00 AM Welding Costs

Pete Ullman — Techniweld

10:00 AM – 11:00 AM The Automation Decision

Jeff Noruk — Sevo Robot Corp.

11:00 AM – 12:00 PM What is "Productivity"? Fritz Saenger — Consultant

12:00 PM – 1:00 PM – Lunch

1:00 PM – 2:00 PM Welding Safety

Kevin Lyttle — Praxair

2:00 PM – 3:00 PM Aluminum

3:00 PM - 4:00 PM

Tony Anderson — Miller Electric Co.

**Stainless and Heat Resisting Steels**William Newell — W.F. Newell & Associates, Inc.

4:00 PM – 4:30 PM Review of the Applications Analysis and a "To Do" List

4:30 PM - 5:00 PM - Adjourn

### TUESDAY, NOVEMBER 10 -WEDNESDAY, NOVEMBER 11

9:00 AM - 5:00 PM

W27: ELECTRON BEAM WELDING CONFERENCE

DAY 1 — TUESDAY

Session 1: General Assembly Chairman: Ernest Levert (IIW)

9:00 AM – 9:15 AM Welcome and Introductions Ernest Levert (IIW, AWS, and DVS)

9:15 AM – 9:45 AM Keynote (USA) Electron Beam Additive Manufacturing (EBAM) Robert Salo and Kenn Lachenberg (USA)

Robert Salo and Kerin Lacrienberg (USA)

9:45 AM – 10:15 AM Keynote Europe: Europe Business Developments

Dr. Thorsten Löwer (Germany)

10:15 AM- 10:30 AM- Break

Session 2: Chairman: (DVS)

10:30 AM – 11:00 AM Electron Beam Welding at the Nuclear AMRC Bernd Baufeld (UK)

11:00 AM – 11:30 AM Electron Beam Welding in the Scientific and Industrial Prototype Production Wilfried Behr (Germany)

11:30 AM – 12:00 PM Comparison of Beam Defocus and Beam Oscillation for Ta-10W-EB Welding Stanley Pierce (USA)



### **CONFERENCES**

### DAY 1 - TUESDAY

12:00 PM - 1:00 PM - Lunch

Session 3:

Chairman: (AWS)

1:00 PM - 1:30 PM

High Strength Electron Beam Brazing of Titanium Aluminides to Dissimilar Materials

Matthias Wahl (Germany)

1:30 PM - 2:00 PM

New Product Introduction —

The Synergy of Product, Tooling and Process

Stefan Longerich (Germany)

2:00 PM - 2:30 PM

TBD

2:30 PM - 3:00 PM

Prediction of the Partial Penetration Depth on 15-5PH Materials during Electron Beam Welding

Kamal Frikach (USA)

3:00 PM - 3:15 PM - Break

Session 4:

Chairman: (IIW)

3:15 PM - 3:45 PM

Moving Towards Industrialization of Local Vacuum EB Welding of Large Fabrications

Chris Punshon, Nick Bagshaw and Robert Nicolson (UK)

3:45 PM - 4:15 PM

Certification of an EB Welding Machine for Production of Critical Aerospace Parts

Stefan Longerich (Germany)

4:15 PM - 4:45 PM

A Plasma Electron Source for Welding and Processing

Sofia del Pozo and Colin N. Ribton (UK)

4:45 PM - Adjourn

DAY 2 — WEDNESDAY

Session 5:

9:00 AM - 9:15 AM

Welcome and Introductions

9:15 AM - 9:45 AM

Challenges of EB Welding in the Construction of Wind Energy Plants Foundation Structures and Gears

Simon Olschok (Germany)

9:45 AM - 10:15 AM

A Neutron Diffraction Study of Residual Stress Due to Electron Beam Welding the Shift Gear Car Transmissions

Peter Petrov (Bulgaria)

10:15 AM - 10:30 AM - Break

Session 6:

Chairman: (DVS)

10:30 AM – 11:00 AM Definition of Beam Diameter for Electron Beam Welding

P. Burgardt and S.W. Pierce (USA)

11:00 AM - 11:30 AM

Application of Low Transformation Temperature LTT-Materials-for-Stress Reduction in Electron Beam Welding

Stefan Gach (Germany)

11:30 AM - 12:00 AM

**Automatic Error Detection in Beam Diagnosis** 

Sebastian Ufer (Germany)

12:00 PM - 1:00 PM - Lunch

Session 7:

Chairman: (IIW)

1:00 PM - 1:30 PM

**Toughness Evaluation of EB Welds** 

Christopher Wiednig (Austria)

1:30 PM - 2:00 PM

Influence of EBW Parameters on the Quality of SAF 2205 Duplex Steel Welds

E. Hodulova, B., Simekova, I. Kovarikova, K. Ulrich, F. Kolenic, D. Drimal (Slovakia)

2:00 PM - 2:30 PM

Advancements in Turbocharger Welding and Brazing

C. Pushon, A. Buxton,

S. Horrex and S. Biamino (UK, Italy)

2:30 PM - 3:00 PM

TBD

3:00 PM - 3:15 PM - Break

Session 8:

Chairman: (AWS)

3:15 PM - 3:45 PM

Electron Beam the Universal Tool for Customized Applications

Uwe Clauss (Germany)

3:45 PM - 4:15 PM

**Electron Beam Welding in the Mirco Range** 

Christian Otten (Germany)

4:15 PM - 4:45 PM

State of the Art Moveable Electron Beam

Generator

Michael Maassen (Germany)

4:45 PM – Adjourn

### **TUESDAY, NOVEMBER 10**

1:00 PM - 4:30 PM

W28: THERMAL SPRAY BASICS —
PUTTING COATINGS TO WORK- FREE

Presenter — James Weber, Sulzer Chemtech USA

This group will discuss most aspects of thermal spray coatings including thermal spray processes, equipment, pre and post treatment, applications, and industry usage. Processes covered will include flame spray (powder, wire, and rod), detonation spray, high velocity oxy/fuel spray (HVOF), cold spray, plasma spray, and twin wire electric arc spray. Several thermal spray guns will be available for attendees to handle throughout the class. Complex automated thermal spray systems and spray booths will be illustrated and discussed. Application examples will be presented for a variety of requirements from several different industries. Industry usage charts will be reviewed listing several processes and coating applications used by various industries.

Open and lively discussion is welcomed and encouraged by the presenter who has nearly 30 years experience in the thermal spray industry.

### RWMA RESISTANCE WELDING SCHOOL

### WEDNESDAY, NOVEMBER 11

7:45 AM - 5:00 PM

W29: RWMA RESISTANCE WELDING SCHOOL — DAY 1

7:45 AM - 8:00 AM

Welcome and Introduction to Resistance Welding

Mark Siehling — RoMan Manufacturing Inc.

### 8:00 AM – 10:00 AM Welding Processes & Machines

This session will reinforce the very essence of how the resistance welding process works and how the process relates to each of the four resistance welding processes. This session will be full of application examples from each process, and will show how machinery utilizes the individual components and elements illustrated in the other sessions.

Tim Foley — Automation International, Inc.

10:00 AM - 10:15 AM - Break

### 10:15 AM – 11:45 AM Materials

Not all materials are created equal, especially from the perspective of resistance welding. This session will present a brief overview of the most common materials joined by the resistive processes. Don will also highlight specific methodologies for joining them that have proven successful over his 20 years in the resistance welding industry.

Donald Maatz — RE Automated

11:45 AM - 12:15 PM - Tabletop Exhibits

12:15 PM - 12:45 PM - Lunch Served

### 12:45 PM - 2:45 PM Electrodes and Tooling

This session will focus on the classification, selection and maintenance of electrodes and fixtures as they pertain to numerous applications. Discover powerful problem/evaluation/solution techniques that will keep a production process running longer—and operation more efficient.

Bill Brafford — Tuffaloy Products, Inc.

2:45 PM - 3:00 PM - Break

### 3:00 PM – 4:45 PM Electrical Power Systems

This session reviews the descriptions and maintenance of electrical power components and conductors from the weld control to the electrode. This lively presentation has something for everybody. Utilizing several small demonstrations, Mark Siehling will keep attendees on the edge of their seats as he highlights the important part of the resistance welding process.

Mark Siehling — RoMan Manufacturing Inc.

4:45 PM – 5:00 PM Ouestion and Answer Session

### **THURSDAY, NOVEMBER 12**

8:00 AM- 4:30 PM

W29: RWMA RESISTANCE WELDING SCHOOL — DAY 2

### 8:00 AM – 10:00 AM Welding Controls

This discussion focuses on the selection, descriptions, and applications of welding timers, contractors, and accessories. Packed with a punch, Don Sorenson drives home understanding energy that creates a weld, H=l2rt, that is unforgettable. Learn how this invaluable formula is used in every resistance welding application–every day–every cycle–all the time!

10:00 AM - 10:15 AM - Break

### 10:15 AM – 11:30 AM Resistance Spot and Projection Weld Standards and Quality

A unique session designed to make you think about the quality standards associated with two common forms of resistance welding, spot and projection. It will also highlight some of the methods used to evaluate the acceptance criteria of these welds. After hearing Don's presentation, it is very possible that you will never look or think about a weld the same again.

Donald Maatz — RE Automated

11:30 AM - 12:30 PM - Lunch Served

### 12:30 PM – 2:15 PM Initial Machine Set-Up

Mike takes the mystery out of weld program setup by guiding attendees through the steps required to select proper welding schedules. He will also introduce preventive maintenance programs designed to make resistance welding operations more profitable. Hands-on demonstrations peak this presentation.

Mike Prokop — Taylor — Winfield Technologies, Inc.

2:15 PM - 2:30 PM - Break

### 2:30 PM – 4:15 PM

### **Troubleshooting and Maintenance**

With over 30 years of experience in the auto industry specifying, installing, and troubleshooting resistance welding systems, Bruce Kelly provides tips on how to find the reasons why welds don't turn out the way some would like. This presentation is filled with real-life examples of problems that have baffled maintenance people for generations.

Bruce Kelly — Kelly Welding Solutions

4:15 PM – 4:30 PM Question and Answer Session

### PROFESSIONAL PROGRAM

Pick and choose between concurrent sessions for the latest in welding research and commercial developments. Pay by the day or attend the entire four-day program, with special discounts for students and members of AWS, FMA, SME, PMA, or CCAI.

1-Day Professional Program: Monday: W30 Tuesday: W31 Wednesday: W32 Thursday: W33

4-Day Professional Program: W34

4-Day Student Professional Program: W35

### **MONDAY, NOVEMBER 9**

# SESSION 1: RECENT PROGRESSES IN OVERLAY AND CLADDING

Chairs: Dr. Hamad Almostaneer (SABIC) and Mr. Gentry Wood (U of Alberta)

# **1A.** 2:00 PM Fundamentals Of Welding In Overlay Welding/Weld Cladding And Quality Of Welds For Use In Industry

Hamad Almostaneer, Yousuf A. Al-Ghadeer and Harry Schrijen, SABIC, Manufacturing Center of Excellence (MCE), Jubail Industrial City, Saudia Arabia

# **1B**. 2:30 PM Effect Of Cooling Rate On The Primary Carbide Size And Distribution In Chromium Carbide Overlays

Nairn Barnes and Patricio Mendez, University of Alberta, Edmonton, Canada

### **1C.** 3:00 PM Effect Of Postweld Heat Treatment On The Properties Of Steel Clad With Alloy 625 For Petrochemical Applications

Tao Dai and John Lippold, The Ohio State University, Columbus, OH

# **1D.** 3:30 PM Friction Stir Welding On A516 Grade 70 Steel Using A Layer By Layer Buildup Approach

Yong Chae Lim, Oak Ridge National Laboratory, Oak Ridge, TN

# **1E.** 4:00 PM Fe Based Nanostructured Welding Deposit Properties And Welding Procedure

Agustin Gualco and Estela S. Surian, National University of Lomas de Zamora , Buenos Aires, Argentina and Hernan G. Svoboda, University of Buenos Aires, Buenos Aires, Argentina

# **1F.** 4:30 PM Mechanical Testing Of CMT-Fabricated 52M Structural Weld Overlay On 304L

Thomas Daniels, The Ohio State University, Columbus, OH

# **1G.** 5:00 PM Predicting Powder Catchment Efficiency In Coaxial Laser Cladding

Gentry Wood and Patricio Mendez, University of Alberta, Edmonton, Canada

# SESSION 2: ADDITIVE MANUFACTURING AND LASER WELDING

Chairs: Dr. Todd Palmer (PSU) and Dr. Patrick Hochanadel (LANL)

# **2A.** 2:00 PM Experimental Measurements Of Processing Parameters In Direct Metal Deposition

Cameron Knapp, Thomas J. Lienert, D. Kovar and Jacob Sutton, Los Alamos National Laboratory, Los Alamos, NM

# **2B.** 2:30 PM Weldability Assessment For Additive Manufacturing Processes

Brandon Kemerling and John Lippold, The Ohio State University, Columbus, OH

### 2C. 3:00 PM Fatigue Performance Of Laser Additive Manufacturing Repaired Ti-6Al-4V

Avinash Prabhu and Sudarsanam Suresh Babu, The University of Tennessee Knoxville, TN, Anil Chaudhary, Applied Optimization Inc., Dayton, OH and Wei Zhang, The Ohio State University, Columbus, OH

# **2D.** 3:30 PM Cooling Rates And Porosity During Laser And Hybrid Laser-Arc Welding

Jared Blecher and T. DebRoy, The Pennsylvania State University, University Park, PA, and Todd Palmer, The Applied Research Lab, University Park, PA

# **2E.** 4:00 PM Feasibility Studies Of Fabricating Functionally Graded Steels Using The Powder Blown Direct Metal Deposition Process

Niyanth Sridharan and Sudarsanam Suresh Babu, University of Tennessee, Knoxville, TN, Ryan Dehoff and William Peter, Oak Ridge National Lab, Oak Ridge, TN, and David Gandy, Electric Power Research Institute

# **2F.** 4:30 PM Effect Of Heat Treatment On Microstructure Evolution Of Nickel Base Superalloy Fabricated By Laser-Powder Bed Fusion Additive Manufacturing

Hyeyun Song and Wei Zhang , The Ohio State University, Columbus, OH and Shawn Kelly, EWI, Columbus, OH

# **2G.** 5:00 PM Hybrid Laser-Gmaw Welding Of A Used Fuel Container

Patrick Martel, Novika Solutions, Quebec, Canada and Chris Boyle, Nuclear Waste Management Organization, Toronto, Canada

# SESSION 3: ADVANCED ALLOYS AND DISSIMILAR JOINING

### (Professor John C. Lippold Symposium)

Chairs: Professors Babu (UTK) and Wei Zhang (OSU)

# **3A.** 2:00 PM Opening Remarks For Special Symposium For Advances In Weldability And Welding Metallurgy

John Lippold, The Ohio State University, Columbus, OH

# **3B**. 2:30 PM Friction Stir Welding And Processing Of Stainless Steels And Ni-Base Alloys

Antonio Ramirez, The Ohio State University, Columbus, OH

# **3C.** 3:00 PM Joining Dissimilar Materials: Understanding Aluminum To Steel Interfaces During Welding And Thermomechanical Conditioning

Emel Taban, Kocaeli University, John Lippold, The Ohio State University, Columbus, OH and Jerry Gould, EWI, Columbus, OH

# **3D.** 3:30 PM An Assessment Of High-Temperature Shape Memory Alloy Weldability

Jeff Rodelas, Sandia National Laboratoreis, Albuquerque, NM and Boian Alexandrov, The Ohio State University, Columbus, OH

# **3E.** 4:00 PM Microstructure-Property Relationships In Creep Resistant Boron Alloyed Martensitic Cr Steels And Their Welded Joints

Peter Mayr and Alexander Nitsche, Technische Universität Chemnitz, Cheminitz, Germany and Christian Schlacher, Graz University of Technology, Graz, Austria

# **3F.** 4:30 PM Laser Beam Weldability Testing Of Austenitic Alloys: Past Results And Future Needs

Jeff Sowards, National Institute of Standards and Technology, Boulder, CO

# **3G**. 5:00 PM Industrial Perspective Of Using Welding Knowledge To Resolve Complex Welding Problems

Wangen Lin, Pratt & Whitney, East Hartford, CT

### **TUESDAY, NOVEMBER 10**

### SESSION 4: DISSIMILAR JOINING

Chairs: Professor Bryan Chin (Auburn University) and Professor Yoni Adony (Letourneau University)

# **4A.** 8:00 AM Low Heat Input Friction Stir Welding Of Aluminum To Steel

Zachary Pramann, EWI, Columbus, OH

**4B.** 8:30 AM Quantitative Study Of Dilution In Dissimilar Metal Weld Through Weld Pool Physics Modeling

Kaiwen Zhang, The Ohio State University, Columbus, OH

# **4C.** 9:00 AM Development Of A Tri-Mode Heating Method For Microwave Joining

Derek Hoyt, Yoni Adony and Seung Kim. LeTourneau University, Longview, TX

# **4D.** 9:30 AM Development Of Novel Functionally Graded Transition Joints For Improving The Creep Strength Of Dissimilar Metal Welds In Nuclear Applications

Jonathan Galler and John DuPont, Lehigh University, Bethlehem, PA

# **4E.** 10:00 AM The Wavy Interface In Ballistic Impact Bonding Of Copper To Low Carbon Steel

Jianping He, Clyde Wikle and Bryan Chin, Auburn University, Alabama **4F.** 10:30 AM Weldability Aspects In Dissimilar Metal Welds Of X65 Steel Pipes With Super Duplex Stainless Steel Filler Metal

Emeric Suma, The Ohio State University, Columbus, OH

# **4G.** 11:00 AM Numerical And Experimental Investigation Of Transient And Residual Stress In GTA Dissimilar Weld

Hamid Eisazdeh, Ajit Achuthan and John Goldak, Clarkson University, Potsdam., NY and Jeffrey R. Bunn, Oak Ridge National Laboratory, Oak Ridge, TN

# **4H**. 11:30 AM Prediction Of Dilution, Mixing And Formation Of UMZ In Linear GTA Dissimilar Welds

Alireza Bahrami, Fulton Co., Pulaski, NY and Daniel T. Valentine, Fatemeh Hejripur-Rafsanjani and Daryush K. Aidun, Clarkson University, Potsdam., NY

# SESSION 5: ADVANCEMENTS IN ARC WELDING

Chairs: Professor Jun Xiao (Beijing University of Technology) and Dr. Larry Jones (EnergynTech)

# **5A.** 8:00 AM Observations Of Metal Transfer In SAW For AC And DC Conditions

Patricio Mendez, University of Alberta, Edmonton, Canada, Gregor Goett, INP Greifswald, Germany and Stuart D. Guest, Stantect, Inc., Calgary, Canada

### **5B.** 8:30 AM Hybrid Induction Arc Welding -HIAW - An Innovative New Process For High Speed Low-Distortion Welding Of T-Fillet Joints

Jerry Jones, Valerie Rhoades and Mark Mann, EnergynTech, Inc., Lakewood, CO, James Dydo, Gatekey Engineering, Canal Winchester, OH and Todd Holverson, Miller Electric, Appleton, WI

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### **TUESDAY, NOVEMBER 10**

# **5C.** 9:00 AM Droplet Temperature Measurements In Variable Polarity GMAW

Cory McIntosh and Patricio Mendez, University of Alberta, Edmonton, Canada

# **5D.** 9:30 AM Evolution In Laser Enhanced GMAW: Applied In CO2 Shielded Arc Welding

By Jun Xiao, Beijing University of Technology, Beijing, China

# **5E.** 10:00 AM Effect Of Current On Metal Transfer In SAW

Vivek Sengupta and Patricio Mendez, University of Alberta, Edmonton, Canada

# **5F.** 10:30 AM Polarity Effect – A Novel Phenomenon In Multi-Electrodes Arc Welding Process

Shujun Chen, Liang Zhang, and Guangqiang Men, Beijing University of Technology, Beijing, China and YuMing Zhang, University of Kentucky, Lexington, KY

# **5G.** 11:00 AM Nanodoping Of Shielding Gas For TIG Welding

Louriel Oliveira Vilarinho, Federal University of Uberlandia, Uberlandia, Brazil

# **5H.** 11:30 AM Key-Hole Effect Of Variable Polarity Plasma Arc On Microstructure Properties Of Aluminum Alloy Weld Joints

Yongquan Han, Haitao Hong, Jiahui Tong and Zhenbang Sun, Inner Mongolia University of Technology, Hohhot, China

# SESSION 6: TESTING AND CHARACTERIZATION

### (Professor John C. Lippold Symposium)

Chairs: Professors Suresh Babu (UTK) and Antonio Ramirez (OSU)

# **6A.** 8:00 AM The Welding Metallurgy And Weldability Of Titanium Alloys

W. A. Baeslack III, Case Western Reserve University, Cleveland, OH

# **6B.** 8:30 AM Materials Research In Welding Using Modern Visualization Techniques

Thomas Kannengeisser, Arne Kromm and Axel Griesche, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

# **6C.** 9:00 AM Recent Developments In Weldability Evaluation Of Advanced Alloys

Boian Alexandrov, The Ohio State University, Columbus, OH

# **6D.** 9:30 AM Weldability And Jointability Of Duplex Stainless Steels

Sergio Brandi, Escola Politecnica University of São Paulo, São Paulo, Brazil

### **6E.** 10:00 AM Use Of Electron Microprobe Analysis To Explain Metallurgical Phenomena And Their Effect On Properties When Welding Stainless Steel

Elin Westin, Voestalpine Böhler Welding, Kapfenberg, Austria and Kaj Grönlund, Corr-Control, Avesta, Sweden

# **6F.** 10:30 AM How Exxonmobil Used Welding Metallurgy To Address Pipeline Challenges

Doug Fairchild and N. Verman, ExxonMobil Upstream Research Co., Spring, TX, H.W. Jin and A. Ozekcin, ExxonMobil Corporate Strategic Research, Spring, TX and M.L. Macia, ExxonMobil Canada Energy, Calgary, Canada

# **6G.** 11:00 AM Solidification Cracking Susceptibility In Ni-Base Alloy 690 As A Function Of Niobium Rich Eutectic Phase

Rebecca Wheeling and John C. Lippold, The Ohio State University, Columbus, OH

### **SESSION 7: METALLURGY AND WELDABILITY**

Chairs: Professor Leijun Li (U of Alberta) and Professor Boian Alexandrov (OSU)

### 7A. 2:00 PM Microstructural Evolution And Creep Rupture Mechanism In Grade 91 Weldment

Leijun Li and Yiyu (Jason) Wang, University of Alberta, Edmonton, Canada

### **7B.** 2:30 PM Microstructural Characterization Of Creep-Fatigue Interactions In 9Cr-1mov Steel And Welds

Harrison Whitt, Tyler Payton, Wei Zhang and Michael Mills, The Ohio State University, Columbus, OH

# **7C.** 3:00 PM Weldability Evaluation In Autogenous Welds Of Alloys 230, 825, And 800H

Sanghyun Suh and Boian Alexandrov, The Ohio State University, Columbus, OH

# **7D.** 3:30 PM Microstructural Evolution Of The Simulated HAZ In Cast Precipitation Hardened Stainless Steels 17-4 And 13-8+Mo

Robert Hamlin and John DuPont, Lehigh University, Bethlehem, PA

# **7E.** 4:00 PM Ferritic And Austenitic Welds In High Strength Steels: Metallurgical Characterization And Weldability Evaluation

Matthew Duffey and Boian Alexandrov, The Ohio State University, Columbus, OH and John Lawmon, AEM, Columbus, OH

# **7F.** 4:30 PM Precipitation Behavior In Multipass Welds Of Ni-Base Super Alloys

Graciela Penso and Boian Alexandrov, The Ohio State University, Columbus, OH

# **7G.** 5:00 PM Nucleation Potency Of Titanium-Containing Inclusions For Acicular Ferrite Formation

Hee Jin Kim and Younmin Kim, KITECH, Chonansi, South Korea and Kangmyung Seo, Hanyang University, Seoul, South Korea

# SESSION 8: ADVANCED SENSING AND CONTROL

Chairs: Dr. YuKang Liu (MathWorks) and Professor John Steele (Colorado School of Mines)

# **8A.** 2:00 PM Virtualized Welding Based Supervised Learning Of Human Welder Behaviors

YuKang Liu, The MathWorks Inc., Natick, MA, and YuMing Zhang, University of Kentucky, Lexington, KY

# **8B.** 2:30 PM Weld Pool Imaging For Real-Time Process Monitoring

Andrew Neill and John Steele, Colorado School of Mines, Golden, CO

# **8C.** 3:00 PM Virtual Reality Controlled Mobile Human Collaborative Welding Robot

Jerry Jones and Valerie Rhoades, EnergynTech, Inc., Lakewood, CO, James Dydo, Gatekey Engineering, Canal Winchester, OH and Andrew Bryant and Jamie Beard, Robotic Technologies of Tennessee, Cookeville, TN

### TUESDAY, NOVEMBER 10

# **8D.** 3:30 PM Process Parameter Optimization For Robotic Welding

Heping Chen and Tyler Sterling, Texas State University, San Marcos, TX and YuMing Zhang, University of Kentucky, Lexington, KY

# **8E**. 4:00 PM A Flexible Sensing System Of 3D Weld Pool Surface For Manual GTAW

Weijie Zhang, Valiant Machine and Tool, Windsor, Canada and YuMing Zhang, University of Kentucky, Lexington, KY

# **8F.** 4:30 PM Research Of Real-Time Quality Monitoring Based On Microphone Array On Pulsed MIG Welding Process

Na Lyu, Shanghai Jiaotong University, Sydney, Australia

# **8G.** 5:00 PM On-Line Modeling Of 3D GMAW Pool Based On RBF Neural Network

Haichao Li and Zeshi Jin, Harbin Institute of Technology, Harbin, China

### **SESSION 9: MODELING**

### (Professor John C. Lippold Symposium)

Chairs: Professors Kimchi (OSU) and David Phillips (OSU)

# **9A.** 2:00 PM Considerations For Use Of Research Data To Impose Requirements In Practice

Damian J. Kotecki, Consultant, Chapel Hill, NC

### 9B. 3:00 PM Computational Modeling Of Microstructure Evolution In Structural Alloys During Welding And Additive Manufacturing – Role Of Experimental Physical Simulation

S. Suresh Babu, The University of Tennessee, Knoxville, TN

# **9C.** 4:00 PM A Simple Index For Predicting The Susceptibility To Solidification Cracking

Sindo Kou, University of Wisconsin, Madison, WI

### **9D.** 4:30 PM Microstructure Modeling And Mechanical Properties Of Simulated CGHAZ Of Hot-Rolled Carbon Steel

Katie Strader, Wei Zhang, Cuixin Chen, and John Lippold, The Ohio State University, Columbus, OH and ZhaoxiaQu, Baoshan Iron and Steel Co., Shanghai, China

### WEDNESDAY, NOVEMBER 11

### **SESSION 10: PLENARY SESSION**

Chairs: Professor Wei Zhang (OSU) and Dr. Thomas Lienert (LANL)

# **10A.** 8:00 AM Welding Metallurgy And Weldability — Past, Present And Future

John Lippold, The Ohio State University, Columbus, OH

# **10B.** 9:00 AM Advanced Sensing And Control Of Welding Processes

YuMing Zhang, University of Kentucky, Lexington, KY

### SESSION 11: PROGRESSES IN FILLER METALS

Chairs: Professor Daniel Foster (Old Dominion University) and Dr. Jorge Perdomo (ExxonMobil)

# **11A.** 10:00 AM Investigation Of Low Temperature Transformation Wires For Plate Distortion Reduction

Steven Blevins, Huntington Ingalls Incorporated-Ingalls Shipbuilding, Pascagoula, MS, Prof. Stephen Liu, Colorado School of Mines, Golden, CO and Joe Scott, Devasco International, Tomball, TX

# **11B.** 10:30 AM Filler Metal Solutions For Extended PWHT (Post Weld Heat Treat) Times In HSLA Steels Floyd Kiel, Voestalpine Böhler Welding USA, Inc., Stafford. TX

### 11C. 11:00 AM Wettability Of Cu-Zr-Xsi-Yti Filler Metals On Sic And Analysis Of The Interfacial Reactions

Juan Wei, Stephen Liu and Juan Carlos Madeni, Colorado School of Mines, Golden, CO

# 11D. 11:30 AM Solidification Cracking Of Dissimilar Metal Welds In Internally Clad X65 Pipes With Low Alloy Steel Filler Metal

Evan O'Brien and Boian Alexandrov, The Ohio State University, Columbus, OH

### **SESSION 12: SOLIDIFICATION**

### (Professor John C. Lippold Symposium)

Chairs: Professors David Phillips (OSU) and Wei Zhang (OSU)

# **12A.** 10:00 AM Solidification Range, Coherency, BTR And SCTR: A Critical Analysis Of Weldabiltiy Relationships

Carl Cross,

Los Alamos National Laboratory, Los Alamos, NM

# **12B**. 11:00 AM Effect Of Eutectic Wetting On Solidification Crack Resistance

Adam Hope, The Ohio State University, Columbus, OH

# **12C.** 11:30 AM Investigation Of Weld Hot Cracking In HASTELLOY X And HAYNES 556 Alloys

Jeremy Caron, Haynes International, Inc., Kokomo, IN

### **SESSION 13: MODELING**

Chairs: Professor Peng-sheng Wei (Taiwan, China) and Dr. Yuping Yang (EWI)

# **13A.** 2:00 PM Prediction Of Pore Shape In Welding Solidification

Peng-Sheng Wei and S.Y Hsiao, National Sun Yat-Sen University, Kaohsiung, Taiwan

# **13B.** 2:30 PM Computational Simulation And Validation Of Welded Aluminum Marine Structures

Charles Fisher, Matt Sinfield, Gary Margelowsky, Caroline Scheck and Nick Jones, Naval Surface Warfare Center, Carderock Division, West Bethesda, MD

# **13C.** 3:00 PM Toward Physics-Based Predictive Modeling Of Inertia Friction Welding

Daniel Tung and Wei Zhang, The Ohio State University, Columbus, OH

# **13D.** 3:30 PM Multiphysics Modeling Of A Welded Furnace Roll For Improving Creep-Fatigue Life

Yu-Ping Yang and Bill Mohr, EWI, Columbus, OH, Dan Cadotte, Joyce Niedringhaus and Dean Stumpf, AK Steel Middletown, OH

# **13E.** 4:00 PM Fillet Size Geometry Control For Extending Steel Weld Fatigue Life

Bill DePorter, JoyGlobal Technologies, Longview, TX

### **WEDNESDAY, NOVEMBER 11**

# **13F.** 4:30 PM Microstructural Comparison Of A High Strength Steel Weld Metal Due To Changes In Welding Arc Weave Parameters

Matt Sinfield and Charles Fisher, Naval Surface Warfare Center, Carderock Division, West Bethesda, MD

# **13G.** 5:00 PM Use Of Sysweld To Identify The Need Of Post-Weld Heat Treatment Of Non-Pressure Retaining External Attachment Welds

Rashed Alhajri, Colorado School of Mines, Golden, CO

# **13H.** 5:30 PM Multi-Scale FEA Modeling Of Brazed Joint Structures In Ni-Based Superalloys For Gas Turbine Applications

Bryan Riggs, Dr. Boian Alexandrov and Dr. Avraham Benatar, The Ohio State University, Columbus, OH

# SESSION 14: SENSING AND CONTROL OF WELDING PROCESSES

Chairs: Professor Sven-Frithjof Goecke (Brandenburg University of Applied Sciences, Germany) and Dr. Jian Chen (ORNL)

# **14A.** 2:00 PM Sensing And Controlling The Heat Input In Gas Metal Arc Welding

Sven-Frithjof Goecke, Brandenburg University of Applied Sciences, Brandenburg, Germany

# **14B.** 2:30 PM Developing Multiple Optical Sensing Techniques For Improving Welding Quality And Productivity

Jian Chen, Zongyao Chen and Zhili Feng, Oak Ridge National Laboratory, Oak Ridge, TN

# **14C.** 3:00 PM Through-The-Arc Monitoring And Control Of Weld Penetration In GTAW

Zeng Shao, Adaptive Intelligent Systems, LLC, Lexington, KY and YuMing Zhang, University of Kentucky, Lexington, KY

# **14D.** 3:30 PM Analytic Weld Pool Model Calibrated By Measurements

Shaojie Wu and Hongming Gao, Harbin Institute of Technology, Harbin, China, Wei Zhang, The Ohio State University, Columbus, OH and YuMing Zhang, University of Kentucky, Lexington, KY

# **14E.** 4:00 PM Visual Behavior Study For Welding Skill Evaluation And Training Xiaoli Zhang and John Steele,

Colorado School of Mines, Golden, CO

# **14F.** 4:30 PM Dynamic Evolution Of The Weld Pool Surface During Weld Penetration Development

Jinson Chen and YuMing Zhang , University of Kentucky, Lexington, KY, and Jian Chen, and Zhili Feng, Oak Ridge National Laboratory, Oak Ridge, TN

# 14G. 5:00 PM Proposition Of Calorimeter For Positional Welding Assessment

Louriel Oliveira Vilarinho and Diandro Bailoni Fernandes, Federal University of Uberlandia, Uberlandia, Brazil

# **14H.** 5:30 PM Development Of Carriage-Type Welding Robot In Shipbuilding

Jae-gwon Kim, Ji-hyoung Lee, Jong-jun Kim and Sang-ryong Shin, Hyundai Heavy Industries, Ulsan, South Korea

# SESSION 15: ALLOYS FOR POWER GENERATION

### (Professor John C. Lippold Symposium)

Chairs: Professors Alexandrov (OSU) and Phillips (OSU)

# **15A.** 2:00 PM Investigations Into The Service Weldability Of Structural Alloys

John DuPont, Lehigh University, Bethlehem, PA

# **15B.** 3:00 PM Weld Procedural Effects On Ductility Dip Crack Formation In High-Cr, Ni-Base Filler Metals

Verner Kreuter and John C. Lippold, The Ohio State University, Columbus, OH

# **15C.** 3:30 PM Assessment And Mitigation Of Grain Boundary Discontinuous Coarsening In INCONEL Alloy 740H Fusion Welds

Daniel Bechetti and John DuPont, Lehigh University, Bethlehem, PA

# **15D.** 4:00 PM Stress Relaxation Cracking Testing Of Superalloys For Power Plant Construction

David Tung and John C. Lippold, The Ohio State University, Columbus, OH

# **15E.** 4:30 PM Understanding Premature Failure Of Welded Creep-Resistant Steels Using Ad-

vanced Testing And Modeling Techniques Xinghua Yu, Baishakhi Mazumder, Wei Tang and Zhili Feng, Oak Ridge National Laboratory, Oak Ridge, TN

# **15F.** 5:00 PM Application Of Weldability Testing To Solve Dissimilar Metal Weld Cracking Problems In The Nuclear Industry

Steve McCracken, Electric Power Research Institute, Charlotte, NC

### **THURSDAY, NOVEMBER 12**

### **SESSION 16: MECHNICAL PROPERTIES**

Chairs: Professor Zhenzhen Yu (Colorado School of Mines) and Professor Sebastian Zappa (National University of Lomas de Zamora)

# **16A.** 8:00 AM Structure-Property Relationship Of Armor Plate Welds Produced With The Hybrid Laser Arc Welding Process

Jeffery Sowards, Daniel S. Hussey and Paul Williams, National Institute of Standards and Technology, Boulder, CO and Stan Ream, EWI, Columbus, OH

### **16B.** 8:30 AM Phase Transformations And Mechanical Properties Of Fusion Welds In 10 Wt% Nickel Steel

Erin Barrick and John DuPont, Lehigh University, Bethlehem, PA

### **16C.** 9:00 AM Effect Of The Welding Process And Weld Geometry On The Susceptibility To Hydrogen Assisted Cracking In 2205 DSS Welds In REAC Systems

Mei He, Boian Alexandrov and Jorge Penso, The Ohio State University, Columbus, OH

### **16D.** 9:30 AM Effect Of Low Transformation Temperature Welding Consumables On The Weld Microstructure And Mechanical Properties

Zhifen Wang and Zhenzhen Yu, Colorado School of Mines, Golden, CO and Zhili Feng, Oak Ridge National Laboratory, Oak Ridge, TN

# **16E.** 10:00 AM Precipitation Behavior During Post Weld Heat Treatment In The Heat Affected Zone Of Grade 91 Steel Welds And Its Influence Of Type IV Cracking

Kyle Stritch and Boian Alexandrov, The Ohio State University, Columbus, OH

### **THURSDAY, NOVEMBER 12**

# **16F.** 10:30 AM Metallurgical Considerations For Low Manganese Electrodes

Michael Kottman, Jonathan Ogborn, Aidan Lawrence and Daniel Langham., The Lincoln Electric Company, Cleveland, OH

# **16G.** 11:00 AM Fundamental Understanding Of Stress Corrosion Cracking In Gas Metal Arc Welding Of A High-Strength Aluminum Alloy

Tyler Borchers and Wei Zhang, The Ohio State University, Columbus, OH

### **16H.** 11:30 AM Effect Of Phase Transformation Behavior On Low Temperature Impact Toughness Of 2.25Cr-1Mo Steels Submerged Arc Welds

Soumya Mohan and John Lippold, The Ohio State University, Columbus, OH, Shenjia Zhang, The Lincoln Electric Company, Cleveland, OH and Suresh Babu, University of Tennessee, Knoxville, TN

# **16I.** 12:00 PM Post Weld Heat Treatment Effects On SMSS Deposit Mechanical Properties

Sebastian Zappa, Jeremias Carlon and Estela S. Surian, National University of Lomas de Zamora, Buenos Aires, Argentina and Hernan Svoboda, University of Buenos Aires, Buenos Aires, Argentina

# SESSION 17: ADVANCED JOINING TECHNOLOGIES

Chairs: Dr. Weijie Zhang (Valiant Machine and Tool) and Dr. Jeff Noruk (Servo Robot)

17A. 8:00 AM Quality First, Last And Always – Laser Vision Gives Robots' Eyes To Improve Weld Quality Jeff Noruk, Servo Robot Corp., Mequon, WI

# **17B.** 8:30 AM Wide Gap Braze Repairs Of Nickel Superalloy Gas Turbine Components

Cheryl Hawk, Colorado School of Mines, Golden , CO

# **17C.** 9:00 AM Central Negative Pressure Arc And Its Characteristics

Fan Jiang, Shan Sheng, Shujun Chen, YuMing Zhang and Dingyong He, Beijing University of Technology, Beijing, China

# **17D.** 9:30 AM Improved FCAW / GMAW For Primed Steels And Aluminum

Nick Kapustka, Paul Blomquist and Harvey Castner, EWI, Columbus, OH

# **17E.** 10:00 AM Researches On Improving Electrode Life In Aluminum Resistance Spot Welding: A Survey

Weijie Zhang, Ian Cross and Suresh Rama, Valiant Machine and Tool, Windsor, Canada

# **17F.** 10:30 AM Advancements In Strip Cladding Technology For Improved Economics

Russel Fuchs, Voestalpine Böhler Welding USA, Inc., Stafford, TX

# **17G.** 11:00 AM Evaluation Of GMAW Technologies For Welding Aluminum In Shipyards

Nick Kapustka and Harvey Castner, EWI, Columbus, OH

# **17H.** 11:30 AM Productivity Through Process Selection In High-Strength Cored Wires

Michael Kottman, James M. Keegan, Radhika Panday and Jonathan Ogborn, The Lincoln Electric Company, Cleveland, OH

### 17I. 12:00 PM Increasing SAW Productivity

Hannes Raudsepp, ESAB Welding & Cutting Products, Gothenburg, Sweden

### **SESSION 18: FERRITIC ALLOYS**

### (Professor John C. Lippold Symposium)

Chairs: Profs. Wei Zhang (OSU) and Menachem Kimchi (OSU)

# **18A.** 8:00 AM Phenomenology And Avoidance Of Hydrogen Assisted Cracking In Advanced Steels

Thomas Bollinghaus, Federal Institute for Materials, Germany

# **18B.** 9:00 AM Friction Technology For Processing Of Advanced Materials: Challenges And Opportunities

Stan David, Oak Ridge National Laboratory, Oak Ridge, TN

# **18C.** 10:00 AM Weldability Study And Simulation Of Haz Sub-Zones Of Quenched And Tempered Hsla Ali Alshawaf and Stephen Liu,

Colorado School of Mines, Golden, CO

# **18D.** 10:30 AM Investigation On Heat-Affected Zone Hydrogen-Induced Cracking Of High-Strength Naval Steels Using The Granjon Implant Test Xin Yue, ExxonMobil, Spring, TX

# **18E.** 11:00 AM Characterization Of Friction Stir Welded ODS Alloys

Xinghua Yu and Zhili Feng, Oak Ridge National Laboratory, Oak Ridge, TN

# **18F.** 11:30 AM The Effect Of Al And Si On Advanced High Strength Steel Weld Mechanical Properties

Stephen Tate, AK Steel, Middletown, OH

# **18G.** 12:00 PM Cold Metal Transfer Weld Overlays On Carbon Steel For Nuclear Power Application

Nate McVicker, Boian Alexandrov and John C. Lippold, The Ohio State University, OH

### **AWS POSTER SESSION**

### **NOVEMBER 9-12 - During Show Hours**

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, which are best communicated visually, as well as research results that call for close study of photomicrographs, tables, systems architecture, or other illustrative materials. Posters are presented in five categories: Students in High School Welding Program, Students in a Two-Year College or Certificate Program, Undergraduate Students, Graduate Students, and Professionals. Be sure to stop by and observe this year's entries.

### **EDUCATIONAL SESSIONS**

### **TUESDAY, NOVEMBER 9**

### 9:00 AM - 3:30 PM

W36: NATIONAL CENTER FOR WELDING EDUCATION AND TRAINING AND WELD-ED

### 9:00 AM - 9:30 AM Welcome / Introductions

Duncan Estep

### 9:30 AM - 10:00 AM Weld-Ed Overview

Discussion is centered on the National Center for Welding Education and Training (Weld-Ed) and its contributions to the field of welding education. Changes in the focus of the NSF grant.

Monica Pfarr — AWS Foundation

### 10:00 AM – 12:00 PM Welding Metallurgy

Welding Metallurgy and Weldability of Commercial Alloys course covers introduction of concepts and fundamentals, and the best educational practice methods to teach heat flow, welding metallurgy, and the weldability of ferrous and non-ferrous commercial alloys. Laboratory work consists of welding metallurgy investigation on the welded samples and weldability testing for specific applications. The presentation will cover part of the week-long professional development course. In addition to topics in welding metallurgy, laboratory assignments, and teaching strategies for presenting topics in welding metallurgy will be provided.

Mark Baugh — Professor Weber State University

### 12:10 PM - 1:00 PM Lunch and Speaker from Hypertherm

### 1:10 PM - 3:10 PM

### **Instructional Design & Teaching Strategies**

The Instructional Design & Teaching Strategies for Welding Instruction course covers development of a welding program from needs assessment through curriculum development, and teach strategies to development and evaluation of student achievement. The module content includes welding program development, writing program and course objectives, use of advisory committees, curriculum development, learning theory, teaching methods, learning styles, laboratory teaching, organization, assignment development, and evaluation methods. The presentation will cover part of the week-long professional development course in addition to topics in instructional design, laboratory assignments, and teaching strategies for improving student learning and retention will be provided.

Rick Polanin — Professor Illinois Central College

### 3:15 PM - 3:30 PM

### Affiliate Network / Wrap up and Evaluations

Join Weld-Ed in our quest to build a solid foundation of highly trained technicians to fulfill the demand of industry. Duncan Estep

### 8:00 AM - 5:00 PM

W37: AWS EDUCATION PROGRAM - DAY 1

8:00 AM – 8:30 AM Coffee and Introductions

8:30 AM - 9:00 AM

### Howard E. Adkins Memorial Membership Award Lecture

The Howard E. Adkins Instructor Membership Award is sponsored by Mrs. Wilma Adkins and family, and is given as a means of recognizing high school, trade school, technical institute or junior college instructors whose teaching activities are considered to have advanced the knowledge of welding to students in their respective schools. Each awardee receives a certificate, two-year membership in the American Welding Society and free registration to attend FABTECH and all technical sessions in the year that the award is presented.

Jeff Mitchell — Dean at Kirkwood Community College

### 9:00 AM - 9:30 AM

### **Adams Memorial Membership Award Lecture**

This award, established by the American Welding Society, is given as a means of recognizing educators whose teaching activities are considered to have advanced the knowledge of welding of the undergraduate or postgraduate students in their respective engineering institutions. Each awardee receives a certificate and all current volumes of the Welding Handbook.

Todd A. Palmer — The Pennsylvania State University/ARL

### 9:30 AM - 9:45 AM - Break and Networking

### 9:45 AM – 10:30 AM Welding in the Digital Age — A Letter to Young Welding Professionals

Is becoming a welding professional a good career choice today? Welding technology is at the heart of many great achievements and is essential for mechanization of agriculture, generation of energy, distribution of clean water, and production of medical devices. In the digital age, the self-driving cars, robots for remote surgery and other products of emerging technologies have their attractions. However, today's dizzying pace of progress often merges mature technologies, such as welding, with new fields like digital data processing into a powerful methodology such as additive manufacturing that has been hailed as the future of manufacturing. This presentation introduces the capabilities of weld modeling in a simple fashion within the context of a real-world example. This presentation is intended to help individuals make informed career choices.

Professor T. DebRoy — The Pennsylvania State University

### 10:30 AM – 11:30 AM Plummer Memorial Lecture

This award has been established by the American Welding Society to recognize an outstanding individual who has made significant contributions to welding education and training, and to recognize Fred L. Plummer's service to the Society as President from 1952 to 1954 and Executive Director from 1957 to 1969. A certificate and bronze medal are presented at the annual Awards Luncheon held during AWS show week. Professor Richard T. Stone is the 2015 Plummer Memorial Award recipient. Professor Stone conducted a comprehensive study to evaluate the cognitive and physical impact of virtual reality (VR) integrated training vs. traditional welder training methods. Participants in this study were randomly assigned to one of two separate two-week training courses taught by sanctioned AWS CWIs. Upon completion of training the participants were given the opportunity to test for certification. This study demonstrated that participants in the virtual reality integrated training group performed as well as, and in some cases significantly better, than the traditional welding training group. Dr. Stone will discuss the benefits of virtual reality technology as a training aid to reduce training time and improve skill levels, compared to traditional welder training methods alone.

Richard T. Stone — Iowa State University

### **EDUCATIONAL SESSIONS**

### 11:30 AM - 1:00 PM

### Lunch & Presentation Sponsored by Hypertherm, Inc.

Plasma, Waterjet, and Oxyfuel: Which Metal Cutting Technology is Right for You?

Jim Colt — Hypertherm, Inc.

### 1:00 PM - 1:30 PM

# Educators Roundtable Discussion: Best Practices in Welding Education and Training

Join the Chairman of the AWS Education Committee and the morning's presenters in a discussion of Best Practices in Welding Education and Training.

### 1:30 PM – 2:15 PM Apprenticeships and Specialty Welding Trades

This interactive session will highlight the exciting and rewarding career opportunities awaiting your students in the skilled trades. Representatives from the major apprenticeships and specialty welding trades will discuss the current and future demand for welders, the benefits of and income potential for careers in the skilled trades, and intake procedures and requirements. You will also learn how to connect your welding program with local union training centers, and how to prepare your students for entry into the skilled trades.

### 2:15 PM - 3:00 PM AWS Foundation Scholarships

The session will focus on the new AWS Educators Scholarships available at the National and District levels. A review of National and District level scholarships for students will also be given to familiarize educators with scholarship opportunities for their students. A question and answer session will follow the presentation.

Sam Gentry and Vicki Pinsky — AWS Foundation

### 3:00 PM - 3:15 PM - Break and Networking

### 3:15 PM - 4:00 PM Leveraging your Advisory Committee to Meet Local Demand

The purpose of an Advisory Committee is to validate, recommend, and guide new and existing technical programs. However, the committee membership, industries represented, continuous contact with the committee, and genuine consideration of committee suggestions is often critical to the success of welding programs. This session will describe the formation of an effective advisory committee, organization of committee meetings, conducting an advisory committee meeting, developing partnerships with local industry, working through advisory committees to develop custom training, and soliciting donations. Examples of the steps in organizing and conducting meetings, follow-up correspondence, interaction with committee members to develop custom training, and using committee suggestions for program improvement will be discussed.

Rick Polanin — Professor Illinois Central College

### WEDNESDAY, NOVEMBER 11

### W37: AWS EDUCATION PROGRAM - DAY 2

### 8:00 AM - 8:30 AM Coffee and Networking

### 8:30 AM – 9:30 AM Welding in the Military

Welders in the military play a special role in supporting our troops by fabricating specialized equipment and by making mission-critical field repairs. This session will provide an overview of the various types of welding being taught in the US Army. Attendees will gain insight into the numerous fabrications that welders in the military are required to make, repairs that they must be prepared to perform, and the types of metals that they must be proficient in welding. This session will also highlight the career opportunities that exist in the military for individuals with a welding background. This includes the opportunity to see the world while serving our country as an Allied Trades Specialist, and to be assigned to units with special welding requirements.

Chief Charles Wheeler — US Army

### 9:30 AM - 9:45 AM - Break and Networking

### 9:45 AM - 10:30 AM

# Where are the Welding Jobs? Workforce Trends, Salaries, and Opportunities

Every welding instructor is concerned about preparing students for good-paying careers in the welding industry. The challenge is keeping up with where the jobs are, how industry trends affect demand for welders, and what welders can expect to earn. This session will focus on the latest data regarding demand for welders, industry sectors with the greatest demand, trends in employment, and earnings potential. A summary of initiatives underway within the AWS Foundation to address the welding shortage will be shared as well as opportunities for others to get involved and make a positive impact on the future of our industry.

Monica Pfarr — AWS Foundation

### 10:30 AM – 11:30 AM Careers in Welding

Career paths in the welding industry are often not well defined. Students seeking entry into welding careers, and instructors seeking to guide students along the correct career path sometimes find career information elusive. This interactive session featuring a panel of welding industry professionals will explore various employment opportunities in the welding industry, the appropriate career pathways that students can follow to achieve their career objectives, and the minimum education and experience required to enter the welding industry at various levels. Pathways to welding technology and welding engineering employment will also be discussed, along with professional society certification requirements.

11:30 AM - 1:00 PM - Lunch

### 1:00 PM - 1:30 PM SENSE Level II Implementation

This session will provide an overview of the new, modularized SENSE Level II — Advanced Welder program. It will also provide a time-line for the implementation of SENSE Level II.

David Hernandez and Ivan Santa Cruz — American Welding Society

### **EDUCATIONAL SESSIONS**

### **WEDNESDAY, NOVEMBER 11**

### 1:30 PM - 2:45 PM

### **SENSE Program Accreditation**

This session will provide an overview of the new SENSE accreditation program for SENSE schools. It will highlight the benefits of welding program accreditation, lay out the milestones for implementing SENSE program accreditation, and walk participants through the steps involved in the accreditation process.

David Hernandez — American Welding Society and Ed Norman — AWS Education Chairman

2:45 PM - 3:00 PM Break and Networking

### 3:00 PM - 4:00 PM WELDLINK

AWS WeldLink is a new and exciting offering from AWS. It provides information and services on career pathways, job demographic data, training organizations, and employers. Online resume and career planning tools are available to provide guidance on competency requirements to pursue many welding career pathways. Registered individuals can earn digital badges for knowledge, education, skills and certifications, where the digital badges provide a common language for matching students, training organizations and employers based on needs. This session will discuss the many benefits of WeldLink to welding schools, students, welding professionals, and employers.

David Hernandez — American Welding Society

### SPECIAL PROGRAMS

### **MONDAY, NOVEMBER 10**

### 7:00 AM - 8:30 AM

**W38: AWS PRAYER BREAKFAST** 

### Prayer Breakfast Speaker

Ron Gruber is executive director of Essential Instructions. The mission of Essential Instruction is to promote community wellness and public safety while preventing crime and victimization. This mission will be accomplished through education, collaboration and ongoing instruction, all from a practical, lessons learned point of view grounded in biblical principles and application. Emphasis will be on prevention as well as recovery and reintegration.

Ron is a professional, motivated individual with many years of experience in human services. He provides pastoral care, Bible studies, and outreach ministry to incarcerated individuals, church youth groups, schools with troubled teens, halfway houses, etc.

Ron shares his God given ability to listen with his heart as well as his ears. He provides counsel and life experiences that will hopefully and prayerfully redirect men, women and children that have experienced various abusive relationships and destructive lifestyles.

### Special Music Soloist

Jeremiah Landon is in his third year as Choral Music Director at Ft. Madison High School in Ft. Madison, Iowa. Prior to his current position, Landon was the Choral Music Associate at Pella High School in Pella, Iowa, and a graduate of the University of Northern Iowa with a BA in Choral Music Education. Jeremiah has served several years as a worship leader in his church and is the son of 2015 AWS President David Landon.

7:00 AM – 7:30 AM Attendees Eat Breakfast

7:30 AM – 7:40 AM Welcome and Opening Prayer

7:40 AM – 7:55 AM Jeremiah Landon

7:55 AM - 8:30 AM Ron Gruber

### MONDAY, NOVEMBER 9 -THURSDAY, NOVEMBER 12

### THERMAL SPRAY DEMONSTRATION

The International Thermal Spray Association will be hosting a live demonstration of the twin wire arc thermal spray process hourly in the North Hall 24000 aisle.

Thermal spray is a low-temperature method for applying wear and corrosion resistant metallic, cermet and ceramic coatings to metal and non-metal parts for surface enhancement and restoration. The demonstration will include the robotic application of pure zinc metal to a variety of objects, including your own paper business cards.

Also, visit exhibitors in the Thermal Spray Pavilion Aisle 24000 to learn more about thermal spray technology, coatings, and equipment and to meet coating service providers from across the country.

# MONDAY, NOVEMBER 9 - WEDNESDAY, NOVEMBER 11

### **ROBOTIC WELDING COMPETITION**

### Location: Hall C1, Booth C1835

The worlds' best robotic arc welding programmers will gather at FABTECH to compete for money and prizes worth over \$10,000. For the first time, there will be two classes, professional and amateur/student. The competition includes both a hands-on test requiring robotic arc welding and a written test which are both in accordance with the Certified Robotic Arc Welding (CRAW) certification program. In addition to the prize money, the first place winner in each category will receive AWS CRAW training and the opportunity to sit for an actual CRAW certification exam at no cost.

### **WELDING WARS COMPETITION**

### Location: Hall C1, Booth C1837

Teams of three student welders (16+) will sign up online (\$10 entry fee per person). Each team will fabricate the weldment on a supplied print using GTAW, GMAW and plasma cutting, with sheared and cut material provided, within a time limit of two hours. A panel of certified welding inspectors will evaluate all weldments to AWS D1.1 based on accuracy of project to print specifications, weld size, overall weldment appearance, craftsmanship, professionalism, safety, etc. Announcement of winners at 4:00 PM on November 11.

### **THURSDAY, NOVEMBER 12**

### 7:00 AM - 6:00 PM

### **AWS CERTIFICATION EXAM**

Advance application required. Take your exam to certify as a CWI, CWE, CWS, CWSR, SCWI, CWEng, or test for endorsements. Call 1-800-443-9353 ext. 273, or go to www.aws.org/certification for details on the certification and registration requirements for each of these programs.

### **AWS SOCIETY EVENTS**

### MONDAY, NOVEMBER 9

### 9:00 AM - 12:00 PM

# AWS OPENING SESSION & ANNUAL BUSINESS MEETING

During the AWS Opening Session and the 96th Annual Business Meeting, 2015 AWS President David Landon will give the Presidential Report and Dave McQuaid will be inducted as the AWS President for 2016. Following the induction, the 2015 Class of AWS Counselors and Fellows will also 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 "Engineering Approximations in Welding – Bridging the Gap Between Speculation and Simulation" by Charles V. Robino. Charles V. Robino received his B.S. in Metallurgical Engineering (1980) and M.S. in Metallurgy (1983) from the New Mexico Institute of Mining and Technology, and Ph.D. in Materials Engineering (1988) from Lehigh University. He joined Sandia National Laboratories in 1988 and is currently a Distinguished Member of the Technical Staff in the Metallurgy and Materials Department at Sandia. His research interests include fabrication and service weldability, transformation kinetics, and thermodynamics. Dr. Robino also performs materials selection and processing studies relating to Department of Energy programs in the defense and energy sectors.

He has authored over one hundred technical publications and over one hundred technical presentations, and has received seven best paper awards from various professional societies. He is a recipient of a Lockheed-Martin Nova Award, an R&D 100 Award, and the American Welding Society Masubuchi Award for outstanding welding researcher under the age of forty. Dr. Robino has held adjunct faculty appointments at Lehigh University and the Colorado School of Mines, and is recent past chairman of the New Mexico Tech Materials Department External Advisory Board. Dr. Robino is an AWS Fellow and a member of ASM International.

### **MONDAY, NOVEMBER 9**

### 6:30 PM – The Hilton Chicago AWS OFFICERS/PRESIDENTS/ COUNTERPARTS RECEPTION

This reception is held annually during the show and is open to all registrants. Take advantage of this opportunity to meet the AWS Officers, network with members and prospects. A complimentary hors d'oeuvres buffet and refreshments are included. Evening business attire, please.

### TUESDAY, NOVEMBER 10

### 12:00 PM - 2:00 PM

# AWS AWARDS/AWS FOUNDATION LUNCHEON

As the Society and the industry it serves have grown, so has the need to recognize outstanding scientists, engineers, educators, and researchers. 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. Tickets will also be available at the door.

### 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 2017. Nominations must be accompanied by 16 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 11**

### 10:00 AM - 10:30 AM

### R.D. THOMAS, JR. INTERNATIONAL LECTURE

The recipient of this year's R.D. Thomas, Jr. Award is Dr. H. Glenn Ziegenfuss. Dr. Ziegenfuss began his IIW standardization involvement on 19 July 1984 as the United States Delegate on the Select Committee Standardization at their meeting during the 37th IIW Annual Assembly in Boston, Massachusetts, USA. The last meeting of the Select Committee Standardization was held on 5 July 2007 when it became Working Group Standardization under the IIW Board of Directors. Dr. Ziegenfuss has attended and participated in every meeting of these two groups since July 1984, a total of 62 consecutive meetings.

Dr. Ziegenfuss also attended and participated in the ISO TC 44, Welding and Allied Processes, plenary meetings as the United States delegate from 1985 through 1998, then as the IIW liaison representative from 1999 through 2009. In addition, he attended and participated in the CEN TC 121, Welding, plenary meetings as the ISO TC 44 representative from 1991 through 1998, then as the IIW liaison representative from 1999 through 2010.

From 1999 through 2010, Dr. Ziegenfuss served as the Standards Officer for IIW.

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

American Council of the IIW, meeting of the US member body of the International Institute of Welding.

### 12:00 PM - 2:00 PM

### AWS SECTION APPRECIATION LUNCHEON AND EXCELLENCE IN WELDING AWARDS CEREMONY

The best and brightest stars in the welding industry will be honored for their outstanding industry achievements at the 13th Annual Excellence in Welding Awards (formerly Image of Welding Awards). Presented by the AWS and WEMCO, a standing committee of AWS, the Excellence in Welding Awards is the industry's top honors saluting the year's most outstanding public initiatives and programs that promote the image of welding. By invitation only. Once again, The Excellence in Welding Awards Ceremony will be held in conjunction with the AWS Section Appreciation Luncheon.



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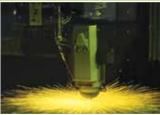
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