Advance Program of American Welding Society
Programs and Events
November 11-14, 2007
Chicago

Conferences
Seminars
Awards
Professional Program
Education Program
Brazing & Soldering Symposium
AWS Committees
Professional Welder Competition
Job Fair & Workforce Pavilion
Society Special Events
WANT TO IMPROVE YOUR PRODUCTIVITY BY 75%?

Ask Lincoln How!

GROFF AG CHALLENGE: Sought ways to improve productivity without sacrificing quality.

LINCOLN SOLUTION: Robotic Cell system from Lincoln, Power Wave® 300M Power Source and a Modified Pulsed MIG Welding Process.

TEAMWORK RESULT: 15% increase in welding productivity and future market growth potential.

See us at FABTECH/AWS Show Booths #4029/5029
AWS Events at FABTECH Int’l & AWS Welding Show 2007

Conferences 2
Vibrant conferences—one on friction welding, and one on hot wire welding and cladding—with the latest technologies and applications.

Seminars 4
Eight practical seminars to enhance your professional skills, with real-world knowledge you can start using right away.

RWMA Resistance Welding School 6
A two-day program that provides basic training and skills-enhancement in resistance welding, plus valuable reference books and a certificate of completion.

Professional Program 7
Three days of sessions on technical topics featuring the most recent welding research and best practices in manufacturing and construction from around the world. Multiple sessions run concurrently, so pick and choose from the topics that are most valuable to you.

Education Sessions 12
Free programs for anyone involved in education and training of welding students, welders, and other welding professionals.

36th Annual International Brazing and Soldering Symposium 13
Expert presentations on brazing and soldering technologies and applications.

Show Events at a Glance 14
Easy scheduling chart.

Society Special Events 16
Society, educational, and social events in conjunction with the show.

Leadership Summit 18
Business and government leaders address the shortage of skilled workers.

AWS Committees and Board 19
Some of the volunteer consensus committees that develop AWS technical standards will be meeting in Chicago. You are invited to observe this interesting and vital process. Plus other committees and the AWS Board of Directors.

About the Show 21
Exhibitor list, travel tips and useful information.

Registration Form 27
Register early and save.

The FABTECH International & AWS Welding Show 2007, with more than 900 exhibitors, is the one place to go this year to find the largest gathering of metal forming, fabricating, tube and pipe, and welding technology providers.

The American Welding Society has always provided exciting and valuable events and programs during its annual Welding Show. This year’s show will be the best ever.
FRICITON WELDING CONFERENCE

This conference will be packed with a number of short presentations on various facets of conventional friction welding, linear friction welding, and friction stir welding. Some of the versions of these processes are capable of welding practically any metal, and to do it without creating fumes.

Monday, November 12 • 8:50 AM — 2:35 PM
Member of AWS/SMA/SME/NAM: $345, Nonmember: $480
Registration Code: W70

8:50 AM—9:00 AM
Welcome and Introduction
Chairman: Bob Irving
Co-Chairman: Suhas Vaze

9:00 AM—9:40 AM
The Four Friction Welding Processes
Daniel Adams, Vice President, Manufacturing Technology, Inc., South Bend, IN; and Tim Haynie, President, Transformation Technologies, Inc., Elkhart, IN
This overall presentation will cover the four main friction welding processes—direct-drive friction welding, inertia friction welding, linear friction welding, and friction stir welding. Daniel Adams will discuss the first three processes and Tim Haynie will discuss friction stir welding. The two companies are collaborating on friction stir welding.

9:40 AM—10:20 AM
Friction Stir Welding at Concurrent Technologies Corporation
Robert W. Semelsberger, Manager, Combat Vehicle Research Program, Concurrent Technologies Corp., Johnstown, PA
Robert Semelsberger will discuss activities involving a $1.3 million contract from the U.S. Army Tank Automotive Research, Development and Engineering Center, involving friction stir welding and the use of aluminum-lithium alloys on future lighter tanks and combat vehicles.

10:20 AM—10:40 AM
New Applications for Friction Stir Welding
Mike Skinner, Business Development Manager, MTS Systems, Inc., Eden Prairie, MN
The aerospace, ground transportation, and marine industries have successfully introduced the friction stir welding (FSW) process into series production on 2-D panel welding applications using the conventional FSW process (fixed pin tools). The focus of this presentation will be on some of the latest production applications utilizing the FSW adjustable and self-reacting process on 3-D complex curvature applications. The following applications will be discussed: fabrication of Volkswagen XC-90 aluminum rims, Nissan Shario high-speed trains, and the NASA Constellation Program (Space Shuttle replacement).

10:40 AM—11:00 AM Refreshment Break

11:00 AM—11:40 AM
Friction Welding of Federal Mogul’s Monosteel Pistons
Carmen Ribeiro, Global Technology—Steel Pistons, Federal Mogul Corp., Ann Arbor, MI
Monosteel Piston innovative technology has been created to address the increasing thermal, mechanical, abrasive, and corrosive challenges placed on heavy-duty diesel engines resulting from emissions regulation. Therefore, an integration of welding process technology (such as friction welding) and product design enhancements has been combined to market the idea.

11:40 AM—12:30 PM
Linear Friction Welding for Aerospace Applications
Martin W. Moffat, Vice-President, Sales and Marketing, The Cyril Barth Company, Monroe, NC
Linear friction welding (LFW) is a relatively new joining technique finding significant value in aerospace turbine engine components and special airframe structures. The focus and value of this technology is with specialty metals such as titanium and certain nickel alloys. By eliminating machining and material loss during processing, LFW can be a valuable technology for joining fan blades to rotating discs. In addition, the use of titanium structures in new commercial aircraft requires new techniques for building various geometric profiles. LFW is a cost-effective process to create airframe structure components, while minimizing process yield loss.

12:30 PM–1:30 PM Lunch
Note: There will be no afternoon refreshment break; however, refreshments will be available in the back of the room.

1:30 PM–1:45 PM
Applications for Direct-Drive Friction Welding
Adam Jarzembowski, President, NCT Friction Welding, Newington, CT
Equipped with nine direct-drive friction welding machines, NCT Friction Welding has compiled considerable experience in many different kinds of applications throughout industry, including the welding of dissimilar metals.

1:45 PM—1:55 PM
Fusion Bonding: Underwater Fastening without Electricity
Chris Hua, Director of Engineering, Nelson Stud Welding, Inc., Elyria, OH
In fusion bonding, a lightweight portable air motor device is used to spin a fastener, which is rammed into the workpiece (e.g., hull of a ship) underwater, and the friction heat forms the weld. The process is a safe, fast, and economical method to attach studs, bolts, and other fasteners, in comparison with alternative methods of welding underwater. This presentation outlines a designed experiment to characterize the weld performance of fusion bonding.

1:55 PM—2:35 PM
Challenges to Deploying Friction Stir Welding in U. S. Army Weapon Systems
Suhas Vaze, Project Manager, Government Programs Office, Edison Welding Institute, Columbus, OH (Co-authors include Brian Thompson, Tim Stoller, Jeff Bernath, and Tim Trapp)
Edison Welding Institute (EWI) has been developing materials joining technologies for the US Army’s Future Combat System (FCS) program under the direction of the Army Research Laboratory (ARL). Previous efforts related to the Expeditionary Fighting Vehicle (EFV, formerly AAV) have shown that friction stir welding can be successfully used in joining 2219/6061 to 2519. This presentation will showcase fabrication of complex aluminum and titanium FCS-like structures, which are technology demonstrators and represent full-scale application of friction stir welding and a step towards deployment of FSW for FCS; and application of VT, UT, and RT for inspecting friction stir welded structures.

2:35 PM—Adjournment
HOT WIRE WELDING AND CLADDING CONFERENCE

There is a great deal of revived interest in hot wire welding and cladding. One version or the other is already being used by participants in the oil and gas industry, by the Navy, and by builders of aircraft engines. Presentations on both hot wire GTAW and hot wire plasma processes will be on the agenda. One topic will be the popular use of hot wire gas tungsten arc cladding of tube and piping for the offshore oil and gas industries. In another presentation, hot wire GTA “narrow groove” welding will be shown to have performed well on titanium. Advantages are increased deposition rates and faster travel speeds.

Tuesday, November 13 • 8:50 AM – 3:15 PM
Member of AWS/PMA/SMR/NAM: $345, Nonmember: $480
Registration Code: W75

8:50 AM—9:00 AM
Welcome and Introduction
Chairman: Bob Irvine
Co-Chairman: Tom Rankin

9:00 AM—9:40 AM
Hot Wire Gas Tungsten Arc Welding—An Overview of Process Applications and Capabilities
Jonathan T. Saltkin, President, Arc Applications, Inc., York, PA
The hot wire gas tungsten arc welding process has found increasing use over a wide range of groove welding, buildup, and cladding operations. Commercially available and specialized hot wire equipment continues to promote application of the process for producing high-quality welds in industries including nuclear power generation, pressure vessel, and offshore oil. Applications will be presented to show the process capabilities, characteristics, benefits, and limitations. Examples of process control and variations to consider will be discussed based on welding requirements, materials, process variables, weld design, and inspection.

9:40 AM—10:20 AM
Hot Wire Narrow Groove Welding and Cladding with Nickel-Based Alloys
Jeff M. Kikel, Manager, Weld Engineering, BWX Technologies, Inc., Nuclear Operations Division, Barberton, OH
Where a considerable amount of work is directed toward pressure vessel fabrication, hot wire gas tungsten arc welding is used extensively for the narrow gap welding of nickel-based alloys. The hot wire process is also used for buildups, butt joints, and cladding of high-strength low-alloy steel.

10:20 AM—10:40 AM
Hot Wire GTAW—Practical Considerations and Applications
Tom Rankin, Vice President and General Manager, ITW Jetline Engineering, Irvine, CA
This talk will cover the early development of the process along with basic theory and important variables. Justification for the use of hot wire process and equipment requirements will be presented. Application examples of successful cladding, joining, and deep groove using stainless and Inconel® will be presented.

10:40 AM—11:00 AM Refreshment Break

11:00 AM—11:40 AM
New Advances in Hot Wire Cladding Applications
Daniel Alford, President, ARC Specialties, Houston, TX
This presentation will be a discussion of recent advances in plasma, variable polarity, as well as new configurations for automatic cladding. New programming techniques for bore cladding will also be discussed.

11:40 AM—12:30 PM
Wire Surface Condition Impacts Hot Wire Weld Quality
Harry Wehr, Technical Director, Arcos Industries, LLC, Mt. Carmel, PA
The surface condition of the welding wire used to make hot wire overlay deposits can impact the quality and integrity of the weld in several ways. A detailed study of 625 welding wire used for hot wire applications has shown that there are three major areas where wire surface condition can impact deposit integrity: surface roughness, residual contaminants, and wire cast. If the weld deposit must be clean and defect-free, each of these areas must be addressed.

12:30 PM—1:30 PM Lunch
Note: There will be no afternoon refreshment break; however, refreshments will be available in the back of the room.

1:30 PM—1:45 PM
Observations from Gus Manz, Inventor of Hot Wire Welding
Gus Manz, President, A. F. Manz Associates, Union, NJ
Hear from the inventor himself, who was awarded a patent on the hot wire welding process on February 25, 1964.

1:45 PM—1:55 PM
Observations from Fritz Saenger, Member of the Original Hot Wire Welding Research Team
Fritz Saenger, Consultant, Columbus, OH
Listen to the observations of Saenger, who was a member of the original research team for the hot wire welding process.

1:55 PM—2:35 PM
Welding and Cladding in the Oil and Gas Industry
Don Schwemmer, President, AMEIT Inc., Redburg, ID, and Calen Wright, President, Arc Innovations Inc., Edmonton, AB, Canada
In response to some of the requirements by the oil and gas industry in Canada, the presenter is narrow groove welding 1-1/2 to 2 in. thick 2205 duplex stainless steel, and cladding 625 Inconel® tubulars.

2:35 PM—3:15 PM
The Benefits of Hot Wire GTAW in the Orbital Welding Industry
Rob Potter, Managing Director, Liburdi Engineering, Dundas, ON, Canada
In this presentation, several applications will be discussed. Included are narrow groove welding, overlay cladding, nuclear canister closure welding, and 1G vs. 5G parameters.

3:15 PM — Adjournment
Seminars

Eight continuing education seminars will give you opportunities to gain practical knowledge on welding and inspection in a lively forum with expert instructors. Seminars are discounted for members of AWS, SME, FMA, or NAM.

ROAD MAP THROUGH THE D1.1/D1.1M:2006 STRUCTURAL WELDING CODE—STEEL
Monday, November 13 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W71
This one-day program provides a comprehensive overview of AWS D1.1:2006, Structural Welding Code—Steel. Each code section, including General Requirements, Design of Welded Connections, Pre-qualification, Qualification, Fabrication, Inspection, Stud Welding, and Strengthening and Repair of Existing Structures, will be summarized with emphasis on their interrelationships and usage. In addition, the role of mandatory and non-mandatory annexes will be reviewed, along with tips on using the code. This program will benefit managers, engineers, supervisors, inspectors, and other decision-makers who need comprehensive understanding of what is, and what is not, covered by AWS D1.1:2006 to improve their job effectiveness.

THE WHY AND HOW OF WELDING PROCEDURE SPECIFICATIONS
Monday, November 13 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W74
If you are responsible for planning a welding operation, which of the following items are most critical: base metal, welding process, filler metal, current and range, voltage and travel speed, joint design tolerances, joint and surface preparation, tack welding, welding position, preheat and interpass temperature, or shielding gas? This course provides the answers.

PRICING AND PROFITABILITY—CONTROLLING THE COSTS OF WELDING
Monday, November 13 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W72
If you are responsible for estimating the cost of welding and determining which process and selection of weld joints is required, then you’ll want to attend this course.

INSPECTION TO THE 2006 D1.1 STRUCTURAL WELDING CODE—STEEL
Monday, November 13 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W73
This one-day course is devoted to inspection of structural steel welds. Inspector qualifications and the responsibilities of inspectors and contractors will be covered. Inspection procedures and techniques are highlighted as a prelude to a detailed review of the inspection acceptance standards. Test method fundamentals will be covered, where necessary, to understand the more in-depth tables and criteria, along with tips on what to look for in inspection reports.

VISUAL INSPECTION WORKSHOP
Tuesday, November 13 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W76
This workshop provides eight hours of expert instruction that includes approximately three hours of instruction in the use of inspection tools, followed by “hands-on” learning for the balance of the workshop. This hands-on training incorporates plastic replicas of welds and also includes a sample practical examination to prepare test candidates for the CWI practical exam.

WELDING OF STAINLESS STEELS (BASICS AND AVOIDING WELD DEFECTS)
Tuesday & Wednesday, Nov. 13–14 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $550, Nonmember: $685
Registration Code: W79
The two-day program focuses on the basic weldability of all types of stainless steels. If you need a comprehensive look at the weldability of stainless steels, particularly the 300 series, this course is for you.

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
You’ll 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 your questions about selecting and welding stainless steels.

METALLURGY APPLIED TO EVERYDAY WELDING
Wednesday, November 14 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W77
Metallurgy of welds in carbon and low alloy steels doesn’t need to be complicated. This short course will help you understand how welding affects the properties of base materials, and how weld defects occur.

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

INTRODUCTION TO MT, PT, UT AND RT
Wednesday, November 14 • 8:30 AM–4:30 PM
Member of AWS/FMA/SME/NAM: $345, Nonmember: $480
Registration Code: W78
The morning session (8:30 AM–Noon) will introduce the non-destructive methods of magnetic particle (MT) and liquid penetrant (PT) testing, and explain inspection techniques and operating principles for visible and fluorescent MT and PT. The discussion will cover basic principles of magnetic particle testing, with emphasis on the characteristics of longitudinal and circular magnetism, and will summarize the use of MT equipment such as yokes, prods, central conductors, and coils. The liquid penetrant testing discussion will include solvent removable, water washable, and post emulsifiable penetrant testing methods.

The afternoon session (1 PM–4:30 PM) will introduce and review the fundamentals of ultrasonic and radiographic testing. Specific topics will include the principles and physics of each method, equipment, measurement techniques, and each method’s advantages and disadvantages. A special section on weld inspection using ultrasonics with AWS D1.1.2006, Structural Welding Code—Steel will be included.

Who Should Attend: Inspectors, welders, production personnel, and students whose responsibilities include the application of quality in welding, and individuals seeking certification in PT and MT from the American Society for Non-destructive Testing.
AlcoTec –
the First Name in Aluminum Wire

AlcoTec is the world’s largest producer of aluminum welding wire and the only single source for all the aluminum alloys currently registered for welding applications. Recognized as a technological leader and innovator, AlcoTec uses state-of-the-art drawing and spooling machinery combined with unique, newly developed processes to provide the best dimensional, mechanical and metallurgical control in the industry.

With AlcoTec, you get more than just premium quality aluminum wire. You also get unparalleled technical support with a staff of metallurgical, welding and quality engineers on hand to offer expert consulting, training, welder qualification and application expertise.

Trust AlcoTec for a solutions-oriented partnership designed to maximize your productivity, reduce start-up time and control overall costs.

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1.800.228.0750 www.alcotec.com

ESAB Welding & Cutting
1.800.ESAB.123 www.esabna.com

See us at the FABTECH/AWS Show Booth #6047
Resistance Welding School

This two-day resistance welding school is sponsored by the American Welding Society and the Resistance Welding Manufacturing Alliance (RWMA), and conducted by industry specialists with extensive resistance welding experience. The basics of resistance welding and real-life application of the process are covered. Each participant may learn at their own pace, and discuss specific welding concerns with the instructors. You are invited to bring your own samples for discussion.

Please plan to be present for both days of the school. The program is limited to 100 students. The registration fee includes a copy of the Resistance Welding Manual, Revised Fourth Edition (a $125 value) and a course binder containing all instructor presentations. Participants will also receive a certificate of completion. In addition, there will be a tabletop reception following the first day of classes, demonstrating the latest resistance welding products offered by RWMA-member companies.

The following processes will be covered:

- Resistance Spot Welding
- Projection Welding
- Cross Wire Resistance Welding
- Upset Resistance Welding
- Flash Butt Welding
- Resistance Butt Welding
- Resistance Seam Welding

Resistance Mash Seam Welding
Roll Spot Resistance Welding
Resistance Welder Electrodes & Tooling
Resistance Welder Controls
Resistance Welder Equipment Selection & Setup
Resistance Welder Power Systems
Resistance Welder Maintenance & Troubleshooting

Tuesday, November 13
7:45 AM — 5:00 PM
5:00 PM — 6:30 PM (Tabletop Exhibit Reception)
Wednesday, November 14
8:00 AM — 3:30 PM
Member AWS/FMA/SME/NAM: $425, Nonmember: $560
Registration Code: W80

Tuesday, November 13
7:45 AM — 8:00 AM
Welcome and Introduction to Resistance Welding Bill Brafford, Technical Liaison Manager, Tuffaloy Products, Inc., Greer, SC
8:00 AM — 8:30 AM
Basics of Resistance Welding Video — Part I

8:30 AM — 11:00 AM
Electrodes and Tooling
Bill Brafford, Technical Liaison Manager, Tuffaloy Products, Inc., Greer, SC
Focus on the classification, selection and maintenance of electrodes and fixtures as they pertain to numerous applications. By revealing some problem-solving techniques and suggestions, Bill will familiarize you with some powerful problem/evaluation/solution techniques that will keep your production process running longer—and operation more efficient.

11:10 AM — 12:15 PM
Welding Controls
Don Sorensen, Director of Engineering, ENTRON Controls, Inc., Greer, SC
This discussion focuses on the selection, descriptions, and applications of welding timers, contactors, and accessories. Packed with a punch, Don drives home H = F RT in a way you’ll never forget. He shows you how this invaluable formula is used in every resistance welding application—every day—every cycle—all the time!

12:15 PM — 1:15 PM
Lunch Served

1:15 PM — 2:15 PM
Welding Controls (continued . . . )
Don Sorensen, Director of Engineering, ENTRON Controls, Inc., Greer, SC
Continuation of discussion on the selection, descriptions, and applications of welding timers, contactors, and accessories.

2:30 PM — 5:00 PM
Electrical Power Systems
Mark Siehling, Vice-President-Engineering, RoMan Engineering Services, Grand Rapids, MI
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 helps you understand this very important part of the resistance welding process which will keep you on the edge of your seat!

5:00 PM — 6:30 PM
Tabletop Exhibits & Reception

Wednesday, November 14
8:00 AM — 10:00 AM
Welding Processes & Machines
Tim Foley, Sr. Applications Engineer, Automation International, Inc., Danville, IL
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 how machinery utilizes the individual components and elements illustrated in the other sessions.

10:15 AM — 10:45 AM
Basics of Resistance Welding Video — Part II

10:45 AM — 12:00 PM
Troubleshooting and Maintenance
Bruce Kelly, President, Kelly Welding Solutions, Grand Ledge, MI
With over 30 years experience in the auto industry, specifying, installing and troubleshooting resistance welding systems, Bruce will give you tips on how to find the reasons why welds don’t turn out the way you would like. This presentation is filled with real-life examples of problems that baffled maintenance persons.

12:00 PM — 1:15 PM
Lunch Served

1:15 PM — 3:15 PM
Initial Machine Set-Up
Robert Matteson, Director-Product Development, Taylor-Winfield, Inc., Brookfield, OH
Robert takes you through the selection and maintenance procedures of proper weld schedules and preventive maintenance programs designed to make your resistance welding operations profitable. Hands-on demonstrations peak this presentation

3:15 PM — 3:30 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 three-day program, with special discounts for students and members of AWS, SME, FMA, or NAM.*

3-day Complete Professional Program; for Member of AWS/FMA/SME/NAM: $225; Nonmember: $360 (Code W84)
3-day Student Professional Program; for Member of AWS/FMA/SME/NAM: $75; Nonmember: $90 (Code W85)
1-day Professional Program (Monday [W81], Tuesday [W82] or Wednesday [W83] only); for Member of AWS/FMA/SME/NAM: $150; Nonmember: $285

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**Monday, November 12 • 8:00 AM–10:30 AM**

### SESSION 1: AUTOMOTIVE WELDING & JOINING APPLICATIONS

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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Panel Distortion Using Low-Heat MIG Braze Welding Process</td>
<td>C. Tsai and C. Kim, Ohio State University, Columbus, OH</td>
<td>Auburn Hills, MI</td>
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<tr>
<td>8:30</td>
<td>Modeling of High Frequency Induction Heating</td>
<td>J. Cadman, J. Swenson, Y. Adonyi, and R. Warke, LeTourneau University, Longview, TX</td>
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<tr>
<td>9:00</td>
<td>Comparison of Welding Processes and Base Metal for Automotive Applications</td>
<td>E. Saran, National University of Loma de Zamora, Buenos Aires, Argentina, H. Seboda, National University of Buenos Aires, Buenos Aires, Argentina, A. Scotti and V.A. Ferraretto, University of Verona</td>
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<tr>
<td>9:30</td>
<td>New Arc Welding and Brazing Processes and Their Benefits in Auto Body Assembly</td>
<td>Y. Cho, Hyundai Motor Company, Seoul, South Korea</td>
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<tr>
<td>10:00</td>
<td>Distortion Control of Resistance Spot Welding of Steel Sheets</td>
<td>K. Hou, L. Liu, and H. Wu, Chang Gang University, Taoyuan, Taiwan</td>
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**Monday, November 12 • 1:00 PM–5:00 PM**

### SESSION 4: RECENT DEVELOPMENT IN CONSUMABLES DESIGN

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<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Location</th>
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<tbody>
<tr>
<td>1:00</td>
<td>Effect of Fluoride Additions on the Diffusible Hydrogen Content in Steel Weld Metal</td>
<td>Y. Murakami, JFE Steel Corporation, Golden, CO and S. Liu, Colorado School of Mines, Golden, CO</td>
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<td>1:30</td>
<td>SMAW Consumable Trials for Strain-Based Design Requirements</td>
<td>M. D. Crawford, J. G. Atkins, D. B. Lillig and J. Sleigh, ExxonMobil Development Company, Houston, TX</td>
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<tr>
<td>2:00</td>
<td>Welding High-Strength Steel with Reduced Heat Input and Improved Productivity</td>
<td>K. Ie and Y. Zhang, University of Kentucky, Lexington, KY and P. Xu, Link-Belt Construction Equipment Company, Lexington, KY</td>
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<tr>
<td>3:00</td>
<td>Novel Tools for Alloy and Welding Consumable Development</td>
<td>B. T. Alexandrov and J. C. Lippold, Ohio State University, Columbus, OH and N. E. Nisley, ExxonMobil, Houston, TX and S. J. Norton, BP America, Houston, TX</td>
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<tr>
<td>3:30</td>
<td>Development of a Ni-Cu Consumable for Reduction of Hexavalent-Cr Emissions When Welding Stainless Steels</td>
<td>J. W. Swarrs, Boain T. Alexandrov, G. S. Frankel, D. Liang, and J. C. Lippold, The Ohio State University, Columbus, OH</td>
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<tr>
<td>3:50</td>
<td>New Method to Design Consumables for Welding High-Strength Pipe Steels</td>
<td>J. C. Maidani, D. Tordomeno, M. Lopetogli, S. Liu, and P. Mendez, Colorado School of Mines, Golden, CO</td>
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<tr>
<td>4:00</td>
<td>Influence of Ti and C Additions on the Microstructure of Fe-Al-Cr Weld Overlay Coatings</td>
<td>K. D. Adams and J. N. DuPont, Lehigh University, Bethlehem, PA</td>
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<td>4:50</td>
<td>Porosity Formation and Mitigation in Underwater Wet Welding</td>
<td>P. Perez and S. Liu, Colorado School of Mines, Golden, CO</td>
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**Monday, November 12 • 8:00 AM–10:30 AM**

### SESSION 2: INDUSTRIAL TECHNOLOGY 1: COATINGS TECHNOLOGIES

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<th>Time</th>
<th>Session Title</th>
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<tr>
<td>8:00</td>
<td>Do All Paths Lead To The Same Coating?</td>
<td>D. Moody, Plasma Powders &amp; Systems Inc., The Village, FL</td>
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<tr>
<td>8:30</td>
<td>Cold Spray, A New Solid-State Material Spraying Technology</td>
<td>J. Villafuerte, Windsor, Canada</td>
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<tr>
<td>9:00</td>
<td>Reliable and Simple Twin Wire Arc Spray Process for On-line Re-Coating from a Tubeweld Seam</td>
<td>F. Van Rodijnen, Sauser Metco OSU GmbH, Duisburg, Germany</td>
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<td>9:30</td>
<td>Overlay: Welding vs. Thermal Spray</td>
<td>P. Sahoo, ASM, LLC, Houston, TX</td>
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<td>10:00</td>
<td>Industrial Application of Magnetic Pulse Welding for Dissimilar and Similar Metals</td>
<td>V. Shrihman, Pulser Ltd, Yavne, Israel</td>
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### SESSION 3: MODELING OF WELDING & JOINING PROCESSES 1

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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Weld Pool Behavior in Arc Welding at High Current</td>
<td>P.F. Mendez, Colorado School of Mines, Golden, CO</td>
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<td>8:30</td>
<td>Predicting Susceptibility of Aluminum Welds to Liquefaction Cracking</td>
<td>C. Huang, Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan and C. Tsai and S. Kau, University of Wisconsin, Madison, WI</td>
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<td>9:00</td>
<td>Transformation Shears and Residual Stress in Constrained Welds</td>
<td>S. Kanda and H.K.D.H. Bhadeshia, University of Cambridge, Cambridge, United Kingdom</td>
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### SESSION 5: WELD SENSING & CONTROL

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<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
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<tr>
<td>1:00</td>
<td>Machine Vision Recognition of Three-dimensional GTA Weld Pool Surface</td>
<td>H. Song, and Y. Zhang, University of Kentucky, Lexington, KY</td>
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<td>1:30</td>
<td>Vision-Based Welding Pool Sensing and Control of Aluminum Alloy Pulsed GMA Welding</td>
<td>Y. Shi, C. Xue, D. Fan and J. Chen, China University of Technology, Beijing, China</td>
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<td>2:00</td>
<td>Sensor Development for Shipbuilding and Offshore Application</td>
<td>H.S. Moon, Y.B. Kim, J.G. Kim and I.W. Park, Hyundai Heavy Industries Co., Ltd., Usan, Korea</td>
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<tr>
<td>2:30</td>
<td>Automatic Detection and Identification of Contaminants during Welding</td>
<td>G. Schwab, T. Vincent and J. Steele, Colorado School of Mines, Golden, CO</td>
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</tbody>
</table>
SESSION 6: FITNESS FOR SERVICE, RESIDUAL STRESSES AND MODERN NDE

A 1:00 PM FFS Assessment of Crack-Like Flaws in Spherical Vessel by S. Han and K. Park, KOREA Gas Safety Corporation, Yong-Da, Korea and D.S. Kim, Shell Global Solutions, Houston, TX and C.L. Tsai, The Ohio State University, Columbus, OH


C 2:00 PM Residual Stress Evaluation of Thermal Barrier Coating with Cold Sprayed CoNiCrAlY Bond Coating by K. Ogawa, T. Nite, and T. Shoji, Tohoku University, Sendai, Japan

D 2:30 PM In-Plane Shrinkage on Welding Distortion in Thin-Wall Structures by W. Cheng, EconoMobil Upstream Research Company and C.L. Tsai, Ohio State University, Columbus, OH

E 3:00 PM Laser Ultrasonic NDE of Small Component Brazes & Weld Joints by G.A. Knorovsky, Sandia National Laboratories, Albuquerque, NM and M. Klein and T. Suleckie, Intelligent Optical Systems, Torrance, CA

F 3:30 PM Hydrogen Induced Cracking and Advanced NDE of Creep Resistant Steel Welds by P.S. Flan, M. Lose and R. Spencer, EWI, Columbus, OH and J.C. Lippold and B.T. Alexandrou, The Ohio State University, Columbus, OH

G 4:00 PM Advanced Electromagnetic Techniques for Hydrogen Content Assessment in Steel Elements by A.N. Lassoing-Jackson, T. Stewart and D. McCaskey, National Institute of Standards and Technology, Boulder, CO and J. Jackson and D. Olson, Colorado School of Mines, Golden, CO

H 4:30 PM Protecting and Improving the Performance of Rotating Components by the Use of a Strain-Tolerant Ceramic Coating by A. Weatherill, ITSA, Lincoln, United Kingdom

SESSION 7: OPTIMIZATION IN ARC WELDING PROCESS

A 9:00 AM Consumable Double-Electrode Gas Metal Arc Welding Process and Control by K. Li and Y. Zhang, University of Kentucky, Lexington, KY


C 10:00 AM Dual Bypass GMAW of Aluminum Rings by X. Liu, Y. Shi and Y. Zhang, University of Kentucky, KY and M. Johnson, Los Alamos National Laboratory, Los Alamos, NM

Tuesday, November 13 • 8:00 AM–12:30 PM

PLENARY PRESENTATION

8:00 AM—9:00 AM Welding & Joining in Scandinavia
Prof. Odd M. Aasle, Sinter Materials & Chemistry, Norway

SESSION 8: STATE-OF-THE-RESEARCH IN WELDING & JOINING IN GERMANY

A 9:00 AM Microstructures and Properties of Friction Spot Welds in a 2-mm Thick Al clad by J.F. de Santos, GKSS, Geesthacht, Germany

B 9:30 AM Effect of Hydrogen on Aluminum Weldability by C.E. Cross and N. Coniglio, BAM, Berlin, Germany

C 10:00 AM Computer-Aided Development of the Crack-Free Laser Welding Processes by V. Ploskikhin, Neue Materialien, Bayreuth, Germany

D 10:30 AM Determining and Avoiding HIC for Specific Welding Conditions by G. Hausmann, Helmut Schmidt University, Hamburg, Germany

E 11:00 AM New Concepts for Low Temperature Joining by J.P. Bergmann, Tech. Univ. Ilmenau, Ilmenau, Germany

F 11:30 AM Simulation of the Welding Distortions in Large Welded Structures by N. Doynoe, Tec. Univ. Brandenburg, Cottbus, Germany

G 12:00 PM Innovation in Joining Technology: Processes and Products for the Future by H. Herold, Univ. Magdeburg, Magdeburg, Germany

SESSION 9: MODELING OF WELDING & JOINING PROCESSES 2

A 9:00 AM Nanoparticle Coalescence and Sintering: Molecular Dynamics Simulation by N. Wang, S.I. Robbli, J. Chen and D.F. Farson, The Ohio State University, OH


C 10:00 AM Heat Transfer, Fluid Flow and Solidified Surface Profile of Various Fillet Joint Configurations and Welding Positions During GMAW by A. Kamra, EconoMobil Upstream Research Company, Houston, TX


E 11:00 AM Bonding Mechanisms for Ultrasonic Consolidation Through Numerical Simulations by C. Zhang and L. Li, Utah State University, Logan, UT

SESSION 10: WELDABILITY OF MATERIALS

A 1:00 PM The Influence of Gd and B on the Solidification and Weldability of a Ni-Cr-Mo Alloy by J.N. DuPont and T.D. Anderson, Lehigh University, Bethlehem, PA and C.V. Robino, Sandia National Laboratory, Albuquerque, NM

B 1:30 PM Macrosegregation in Dissimilar-Filler Welds by Y. Yang and S. Kou, University of Wisconsin, Madison, WI

C 2:00 PM Elevated Temperature Cracking in Alloy G22 by M. Gallagher and J.C. Lippold, The Ohio State University, Columbus, OH

D 2:30 PM Microstructural Insights into Ductility Dip Cracking In Ni Based Filler Metals by F.F. Noecker II and J.N. DuPont, Lehigh University, Bethlehem, PA and G.A. Young Jr., Lockheed Martin, Schenectady, NY

E 3:00 PM Development and Application of Ternary Solidification Models for Understanding Weldability Phenomena in Engineering Alloys by J.N. DuPont, Lehigh University, Bethlehem, PA

F 3:30 PM Effect of Microstructure on Reheat Cracking in the HAZ of Type 347 Stainless Steel by J. Phang-on and J.C. Lippold, The Ohio State University, Columbus, OH

G 4:00 PM Liquidation Tendency of Al and Mg Alloys in Friction-Stir Spot Welding by Y. Yang and H. Dong, University of Wisconsin, Madison, WI

H 4:30 PM Resistance Sealing and Parting of Stainless Steel Tubing for Nuclear Waste Applications by L. Zirkel, Idaho National Laboratory, Idaho Falls, ID and R.T. Chmaros, CenterLine (Windor) Ltd, Windsor, Canada

SESSION 11: NAVY-SPONSORED SESSION OF ARC WELDING PROCESSES


B 1:30 PM An Investigation into Cracking on Aluminum Superstructures by K.N. Tran, W. Gomi and E. Murcko, Naval Surface Warfare Center, West Bethesda, MD and Philadelphia, PA

C 2:00 PM Joining AL6061-T4 Superalutnetic Stainless Steel by GMAW-P, PAW, and Hybrid LBW by P.J. Konkel and M.F. Mruczek, Concurrent Technologies Corporation

D 2:30 PM Reducing Mn Fumes during PCAW of High-Strength Steels by M.F. Mruczek and P.J. Konkel, Concurrent Technologies Corporation and S. Ferree and M. Sierdzinski, ESAB Welding and Cutting Products

E 3:00 PM Tandem Gas Metal Arc Welding for Out-of-Position High Strength Steel Erection Joints by N. Porter, Edison Welding Institute, Columbus, OH

F 3:30 PM Cold-Wire-Feed Submerged Arc Welding by M.F. Mruczek and P.J. Konkel, Concurrent Technologies Corporation

G 4:00 PM High-Speed Tandem Submerged Arc Welding of Thin Steel Panels for Naval Surface Combatants by N. Porter, Edison Welding Institute, Columbus, OH

SESSION 12: INDUSTRIAL TECHNOLOGY 2: MANAGEMENT AND TRAINING

A 1:00 PM Total Welding Management by J. R. Barckhoff, Barckhoff Welding Management Corp., Victoria, MN

B 1:30 PM What Contract Managers Need to Know About Welding Code Requirements in Their Projects by A. Petroski, Alena, Inc., Chicago, IL

C 2:00 PM CS WAVE: Virtual Reality for Welders’ Training by L. D’Alton, CS Communications & Systems, Toulouse Coder 6, France; D. Stein and D. Melliot-d’Huart, AFPM, Versailles Cedex, France

D 2:30 PM Cracked Workmanship Sample Blocks Solve Unique Inspection Problems by L. Zirkel and J. Oswald, Idaho National Laboratory, Idaho Falls, ID

E 3:00 PM Saving Time and Money with Simulation Resistance Welding Software by K. Chan, Husys Industries Limited, Weston, Canada


G 4:00 PM Fusion Bonding: Underwater Fastening Without Electricity by C. Hsu, J. Thomas and B. Ruk, Nelson Stud Welding, Inc., Elyria, OH

H 4:30 PM New Advances in Induction Brazing by K. Spain, Radyne Corporation, Milwaukee, WI

PLenary PREsentATION

8:00 AM – 9:00 AM Welding & Joining in Korea
Dr. Jeong-hun Kim, Executive Director, KITECH Incheon Research Center, Korea

SESSION 13: ELECTRON BEAM WELDING

A 9:00 AM Coupling CNC Part Motion with High-Speed EB Pulsing Helps Enhance Hole Drilling Capabilities by G.G. Schubert, J. Dowd and D. Powers, PTR-Precision Technologies, Inc., Enfield, CT

B 9:30 AM Megahertz Beam Deflection Capability Broadens EB Usage Spectrum by G.R. LaFlamme, J. Ralph and D. Powers, PTR-Precision Technologies, Inc., Enfield, CT

C 10:00 AM Vacuum Effects Electron Beam Welding by P. Bargardt, Los Alamos National Laboratory, Los Alamos, NM


E 11:00 AM Engineering Microstructures and Properties of EB Welds to Join Thick-Section HSLA-100 Steel by M. Johnson, A. Dafield and P. Bargardt, Los Alamos National Laboratory, Los Alamos, NM

F 11:30 AM A Comparison of Pulsed, Out of Focus and Circle Deflection Electron Beam Welding of Stainless Steel: Morphology and Microstructure by P. Hochanadel, D. Rautz and J. Martinez, Los Alamos National Laboratory, Los Alamos, NM

SESSION 14: LASER BEAM WELDING

A 9:00 AM Nonlinear Identification of Diode Laser Welding Process by X. Na, Y. Zheng and B.L. Walcott, University or Kentucky, Lexington, KY

B 9:30 AM Laser Beam Welding of Haynes 230 by P. Bargardt and T.J. Lienert, Los Alamos National Laboratory, Los Alamos, NM

C 10:00 AM Evaluating Keyhole Mode Laser Welds via High Speed Imaging by J. Norris, C.V. Robino, M. Perricone, K. Fuerschbach and M. Martinez, Sandia National Laboratories, Albuquerque, NM

D 10:30 AM Hybrid Laser Arc Welding of HY-80 Steel by C. Roopke, Colorado School of Mines, Golden, CO
SESSION 15: NAVY-SPONSORED SESSION ON FRICTION STIR WELDING

A 9:00 AM Friction Stir Welding of Ti-5111 by J. Nguyen, Naval Surface Warfare Center, West Bethesda, MD and L. Salamanca-Riba, University of Maryland, College Park, MD

B 9:30 AM Material Selection Information on Friction Stir Welds for LIA-6 by C. Davis, M. Posada and J. DeLoach, Naval Surface Warfare Center, West Bethesda, MD

C 10:00 AM Aluminum Friction Stir Welds for Naval Structures by M. Posada, J. DeLoach and C. Davis, Naval Surface Warfare Center, West Bethesda, MD

D 10:30 AM Nondestructive Inspection Requirements for Friction Stir Welds by K. Lipetzky and N. Trepal, Naval Surface Warfare Center, West Bethesda, MD, R. Rob, Naval Sea Systems Command, Washington, DC

E 11:00 AM Corrosion Evaluation of Friction Stir Processed Nickel Aluminum Bronze by J. Nguyen and R. Park, Naval Surface Warfare Center, West Bethesda, MD and M. Kroju and E. Lennesi, Naval Research Laboratory, Key West, FL

Wednesday, November 14 • 1:00 PM–5:00 PM

SESSION 16: WELDING METALLURGY

A 1:00 PM Laser Weld Repair of Single Crystal Superalloys by T. Anderson and J.N. DuPont, Lehigh University, Bethlehem, PA

B 1:30 PM Heat Treatment Optimization of High-Alloy Stainless Steel by J. Farren and J.N. DuPont, Lehigh University, Bethlehem, PA

C 2:00 PM Materials Properties Evaluation of Alloy 605 Base and Weld Metal by J. Shingledeker and R. Miller, Oak Ridge National Laboratory, Oak Ridge, TN


E 3:00 PM Applying 3Ni Alloy to Cryogenic Pipelines by B.D. Newbury, D.B. Lillig and P.M. Sommerfeld, Exxon Mobil Development Company, Houston, TX


G 4:00 PM Composite-Like Engineered Welds for Achieving Multiple Improved Properties by J. Jackson, E. Soderstrom, P.F. Mendez and D.L. Olson, Colorado School of Mines, Golden, CO and A.N. Lasseigne-Jackson, NST, Boulder, CO

H 4:30 PM Using Alternating Gases during GMAW of 6000 Series Aluminum Plate by A.M. Gallaway, University of Strathclyde, Glasgow, Scotland

SESSION 17: ADVANCES IN FRICTION STIR WELDING

A 1:00 PM Novel Nuclear Fuel Plate Fabrication Using the Friction Stir Weld Process by N.P. Hallinan, D.E. Barkes, J. Wight, M.D. Chapelle and C.R. Clark, Idaho National Laboratory, Idaho Falls, ID

B 1:30 PM Thermal Stir Welding - A New Solid-State Welding Process by J. Ding, NIST, Huntsville, AL and B.H. Walker, Port St. Lucie, FL


D 2:30 PM Finite Element Modeling of Friction Stir Welding by Y. Mao and R.B. Madigan, Montana Tech of the University of Montana, Butte, MT and T.J. Lienert, Los Alamos National Lab, Los Alamos, NM

E 3:00 PM A Linear Variable Shoulder Pressure in Pin Tapered Reduction for Closure Stir Welding by D. Lammlein, D. DeLapp, A. Strauss, P. Fleming, Vanderbilt University, Nashville, TN and T.J. Lienert, Los Alamos National Lab, Los Alamos, NM

F 3:30 PM Control of Normal Tool Stress during Friction Stir Welding by R.B. Madigan, B.J. Shubert, Y. Mao, Montana Tech of the University of Montana, Butte, MT and T.J. Lienert, Los Alamos National Lab, Los Alamos, NM


SESSION 18: INDUSTRIAL TECHNOLOGY 3: ARC WELDING TECHNOLOGIES

A 1:00 PM New Applications for Gas Metal Arc Welding by N. Kapusta, C. Conroy and N. Porter, EWI, Columbus, OH


C 2:00 PM Comparison of TOPTEG and GMAW Weld Processes for Robotic Welding by L. Romano, Air Liquide Canada Inc., Montreal, Quebec


E 3:00 PM TARC Process; Robust Single-Sided Metal Stamping Fastener Welding without Fixture by C. Hsu, J. Mumaw, Nelson Stud Welding, Inc., Elyria, OH

F 3:30 PM Welding Automation by Z. Marnell, Orbiform Group, Jackson, MI

AWS POSTER SESSION

Sunday — Wednesday, November 11—14
9:00 AM — 5:00 PM Sunday, and show hours on Monday — Wednesday
FREE

The AWS Poster Session is an integral part of the 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 a 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.

2-YEAR DEGREE OR CERTIFICATE STUDENT LEVEL

Effects of Different Shielding Gases on Bead Shape
by Frank Starnes, Cy-Fair College, Houston, TX

4-YEAR DEGREE STUDENT LEVEL

Joining of Aluminum to Non-Ferrous Metals
by J. Sammons, K. Izor and M. Carney, The Ohio State University, Columbus, OH

Heat-Affected-Zone Cracking Mechanisms
by N. Erchak, J. Will and E. Ash, The Ohio State University, Columbus, OH

Weldability of Hastelloy X and Haynes 230
by K. McCall, J. Seaman and M. Triplett, The Ohio State University, Columbus, OH

Empirical Formulae for Extended Stick-out Strip Cladding
by R. Neel, A. Guethlein, and M. Myers, The Ohio State University, Columbus, OH

HAZ Study of SAW Welds on High-Strength Steel
by M. Barrett, B. Hammond, and D. Straub

Evaluating the Effect that Core-Wire Alloy Content
by W.T. Gunning IV, B. Navarre and O. Onwuama, The Ohio State University, Columbus, OH

Deformation Resistance Welding
by D. Failla, C. Huber and E. Callbreath, The Ohio State University, Columbus, OH

Effect of Welding Power Supply Type of E9015-B9 SMAW Weld Deposits
by W.J. Christy, K. Thomas and W.H. Thompson

Through-Transmission Laser Welding of Polypropylene Clay Nanocomposites
by P. Gavrani, D. Han and D. Foster, The Ohio State University, Columbus, OH

Ultrasonic Weldability of Advanced Metals
by H. Khan, C. Kramer and J. Ocasio, The Ohio State University, Columbus, OH

Joining of Aluminum to Ferrous Materials
by S.A. Brooke, K.A. Craver and J. Robillard, The Ohio State University, Columbus, OH

GRADUATE DEGREE STUDENT LEVEL

Thermit Welding of Heat Exchanger Tubes
by J. Nickell, Colorado School of Mines, Golden, CO

PROFESSIONAL/COMMERCIAL

Application of Robotic Arc Welding Technology
by V. Juiras, and I.V. Crespo, AIMEN, Pontevedra, Spain and S. Barreras, AISTER, Pontevedra, Spain

In-Process Quality Assurance for Titanium GTAW
by D.A. Hartman, M.J. Cola and V.R. Dave, Beyonds-Sigma, Santa Fe, NM

Characterization of Friction Stir Welded and Superplastically Formed — Friction Stir Welded Titanium 6Al-4V Alloy
by D.G. Sanders and P. Edwards, The Boeing Company, Seattle, WA and M. Ramulu, University of Washington, Seattle, WA
E d u c a t i o n   S e s s i o n s

Free sessions that highlight the latest developments in welding education and training programs.

PLUMMER MEMORIAL EDUCATION LECTURE

Observations from 40 Years of Welding Training
Tuesday, November 13
10:00 AM — 11:30 AM
FREE

The Plummer Memorial Education Lecture 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. The recipient of this award will deliver a lecture and receive this educational distinction.

This year’s presenter is Mr. Andy Godley, Director of Training, Southern Company. Mr. Godley has devoted his entire life to welding education. From teaching and consulting in 1967 to presently working for Southern Company, as well as serving on the National SkillsUSA Welding Technical Committee and the AWS Education Committee. If it’s been done in welding education, Andy’s done it. Attend and enjoy a straight-forward presentation as observed from over 40 years of welding education.

NATIONAL SCIENCE FOUNDATION GRANT FOR NATIONAL CENTER OF EXCELLENCE IN WELDING EDUCATION & TRAINING

Tuesday, November 13
1:00 PM — 4:00 PM
FREE • Registration Code: W86

The National Center for Welding Education and Training (NCWET) was created in July 2007 to increase the number of science and engineering welding technicians to meet workforce demands. The Center furthers comprehensive reform in welding education by providing technologically current educational materials and professional development opportunities to two-year colleges and other educational institutions.

Presentations in this session will discuss the formation of NCWET, the roles of the Center’s partners and the initial plans for operation of the Center. Also to be discussed are industry training needs and expectations as well as the use of Workforce Skills Panels in providing input to Center planning and operations.

Session 1: National Center of Excellence in Welding Education & Training
Mr. Ken Smith, Lorain County Community College and Mr. Jim Key, AWS Past President

Session 2: Industry Input & Expectations
Mr. Ernest Levert, Senior Staff Manufacturing Engineer, Lockheed Martin

Session 3: Presentation on Workforce Skills Panels
Mr. Robert Viskos, Workforce Institute

HIGHER EDUCATION WELDING UPDATE

Wednesday, November 14
10:00 AM — 2:00 PM
FREE • Registration Code: W86

Experience the new technology and delivery methods that higher education is using to advance our students to new heights. Attend and find out how these educational institutions are preparing tomorrow’s workforce, today!

10:00 AM — 11:00 AM Session 1: Ferris State University
Mr. Jeffery Carney, Assistant Professor

11:15 AM — Noon Session 2: Pennsylvania College of Technology
Mr. Dave Cotner, Welding Instructor

1:00 PM — 2:00 PM Session 3: Montana Tech of the University of Montana
Mr. R. Bruce Madigan, PhD, P.E. Associated Professor

AWS PROFESSIONAL WELDERS COMPETITION

Show Floor of North Building

Competition Hours:
Monday, November 12
9:30 AM-12:30 PM and 1:30 PM-4:30 PM
Tuesday, November 13
9:30 AM-12:30 PM and 1:30 PM-4:30 PM

Awards Ceremony:
Wednesday, November 14
10:00 AM

Winners will be announced at the awards ceremony. (Winners need not be present.)

The Professional Welders Competition Committee sponsors the competition, and welcomes the assistance of Indiana Section 27.

Professional welders will compete on the show floor for a grand prize of $2,500. The welding procedure involves welding a 3 x 3 x 3/8-inch angle to a 1/4 x 6 x 6-inch horizontal plate using shielded metal arc welding (SMAW). Each participant will set his/her own current and voltage prior to welding and must clean the weldment following welding to prepare for the inspection process. Competitors will have five minutes to create a single-pass 5/16-inch fillet weld using 5/32-inch E7018 electrode on low-carbon steel. Each competitor will be allowed one attempt at creating the weldment; no retests are allowed. The contest will be judged by a team of AWS Certified Welding Inspectors using the criteria in AWS D1.1, Structural Welding Code—Steel, and verified using automated inspection equipment.

In addition to the $2,500 grand prize, a $1,000 second prize and a $500 third prize will be awarded, and the top 12 competitors will win an AWS duffel bag. Each participant will receive an AWS Professional Welders Competition t-shirt.

Competitors must be at least 19 years old, sign a form stating that they are professional welders, and pay a $10 entry fee. You may bring your own helmet, protective clothing, earplugs, etc., or use those provided at the competition site. Registration will take place at the Professional Welders Competition booth on the show floor in the North Building between 12:30 and 4:30 PM on Sunday, November 11, or Monday and Tuesday, November 12-13, during the competition. Note: Registration for the exposition is required to gain admittance to the show floor.

For more information about the Professional Welders Competition, including complete competition rules and safety rules, please visit www.aws.org/competition.
The 36th Annual Brazing & Soldering Symposium is a must-attend event if you work in the field of brazing and soldering or have an interest in research and applications, as well as networking with industry experts.

Tuesday, November 13
8:30 AM – 4:40 PM
FREE • Registration Code: W87

Tuesday, November 15 • 8:30 AM–12:10 PM

8:30 AM Case Study: Failure Analysis of Solder Joints on a Connector Assembly
by P. Vianco, A. Klgo, G. Zander, and P. Hlavá (Sandia National Laboratories, Albuquerque, NM)

8:50 AM Development and Characterization of Amorphous Filler Metals for Joining of Magnesium Alloys
by Silke Muettekoch, Guadrun Fritsche, Bernhard Wiedage (Institute of Composite Materials and Surface Technology, University of Technology, Chemnitz, Germany)

9:10 AM Effect of Ce on Property and Microstructure of Sn-Ag-Cu Solder
by Xue Songhai, Wan Jiangsin, Han Zongjie (College of Materials Science and Technology, Nanjing University of Aeronautics and Nanjing, China); Gu Liyong, Gu Wenhua (Changshu Huayin Filler Metals Co., Ltd, Changshu, China)

9:30 AM Laser Soldering with Lead-Free Solder Alloy for Electronic Packaging
by Yu Shenglin (Nanjing Research Institute of Electronics Technology and College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing, China); Xue Songhai, Han Zongjie, Wang Jianxin, and Zhang Xin (College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing, China)

9:50 AM Solderability Testing of Pb-Free Solder Alloys Versus Sn-57Pb Eutectic Solder for High-Reliability Applications
by Eden P. Lopez, and Paul Vianco (Sandia National Laboratories, Albuquerque, NM)

10:10 AM Advances in Brazing and Soldering with Reactive Multilayer Foil Applications
by A. Duckham, Y. Yan, D. Deger, and T. P. Weins (Reactive Nano Technologies, Inc., Hunt Valley, MD)

10:30 AM Joining of High Strength Aluminum-Based Lightweight Materials by Tin Based MMC Solder
by Bernhard Wiedage, Ina. Hoier, and Sebastian Weis (University of Technology, Chemnitz, Germany)

10:50 AM Ultrasonic Soldering and Brazing
by T. Prech, K. Graf, and D. Hauser (Edison Welding Institute, Columbus, OH)

11:10 AM The Arc Spray Application of Braise Material to Copper/Brass Heat Exchangers
by P. Katsopoulos (Praxair Surface Technologies, Grapevine, TX)

11:30 AM Ultrasonic Imaging and Quantitative Analysis of Defects in Ag-Cu-Zr Active Brazing Joints

11:50 AM Fundamental Studies for Joining Yttria Stabilized Zirconia (YSZ) to Groffier12-APU by Reactive Brazing
by O. A. Quinlan and J. E. Indacocnea (Department of Civil and Materials Engineering, University of Illinois at Chicago, Chicago, IL)

Tuesday, November 15 • 1:00 PM–4:40 PM

1:00 PM Corrosion Testing of BNi-3 Brazed Surfaces on Type 347 Stainless Steel for the Space Station Internal Cooling System
by M. J. Pohlmam and C. S. Jeffcoat (Honeywell Aerospace, Torrance, CA)

1:20 PM Safety in Cutting, Brazing & Welding with Acetylene & Oxygen
by Jesse A. Grantham (Welding & Joining Management Group, Westminster, CO)

1:40 PM Brazing & Forming Technology Produce Economical High-Temperature Oven Trays
by William J. Powers (HiTech Metal Group, Cleveland, OH)

2:00 PM Fluoride Ion Cleaning as a Pre-Braze Process
by Robert E. Kornfeld (HiTech Furnace System, Inc., Shelby Township, MI)

2:20 PM Innovations for the Manufacture of Industrial Heat Exchangers
by S. Ranganathan and D. Fortuna (Alcoa Metals [US] Inc., Troy, MI)

2:40 PM Virtual Reality to Speed Up the Certification Process of Brazing
by C. Choquet and O. LisaLeCaron (123certification, Inc., Montreal, QC, Canada)

3:00 PM Advantages of Flux-Cored Braise Materials for Open Air Brazing
by Creed Darling (Lucas-Milbapt, Inc., Cudahy, WI)

3:20 PM Brazing of Copper with Cu-base Brazing Filler Metals
by E. Vanegas and T. Oyama (WESCO Metals, Hayward, CA)

3:40 PM Comparison of Metal-Ceramic Brazing Methods
by C. A. Walker and V. C. Hodges (Sandia National Laboratories, Albuquerque, NM)

4:00 PM High-Strength, Ductile Braise Repairs for Stationary Gas Turbine Components
by Warren Mighelli (University of Pretoria and GE Aviation) and Prof. Madeleine Du Toit (University of Pretoria)

4:20 PM Study on the Wetting of Glass-to-Metal Joining
by C.-P. Chou, K.-H. Tseng, H.-Y. Huang, H.-D. Chen (National Chiao Tung University, Hsinchu, Taiwan; and Metal Industries Research & Development Centre, Kaosting, Taiwan)
SUNDAY, NOV. 11
Show hours 11 am–4 pm

CONFERENCEs

SEMINARS
Continuing education programs to enhance your career

PROFESSIONAL PROGRAM
State-of-the-art technical presentations

FWMA SCHOOL

EDUCATION SESSIONS
Free programs for welding educators

SPECIAL EVENTS
Mostly free volunteer and networking events for people who want to get more involved

SHOW OPENING

AWS FOUNDATION

DISTRICTS COUNCIL

MONDAY, NOV. 12
Show hours 9 am–5 pm

FRICITION WELDING CONFERNECE

INSPECTION TO NEW D1.1
ROADMAP THROUGH D1.1
PRICING & PROFITABILITY
WHY & HOW OF WELDING PROCEDURE SPECIFICATIONS
AUTOMOTIVE APPLICATIONS
COATINGS TECHNOLOGIES
MODELING 1
CONSUMABLES DESIGN
WELD SENSING & CONTROL
FITNESS FOR SERVICE, RESIDUAL STRESSES & NDE

SHOW EVENTS at a Glance

Technology Areas
Management
Operations/Lean
Automation
Cutting
Lasers
Fabricating/Forming
Materials, Processes
Safety
Stamping
Tube & Pipe

9:30 – 11:30 am
Management
R&D Tax Credit (F10)
Lean 101–Principles of Lean Manufacturing (F11)
Comparative Cutting with Tech Tour (F12)
Roll Forming (F13)
Adding Powder Capabilities to the Job Shop (F14)
Safety & Health Concerns for Management/Business Owners (F15)
Introduction to Metal Formability (F16)
Tube & Pipe Production (F17)

1:30 – 3:30 pm
Lean Accounting (F20)
Basic Management for Emerging Team Leaders (F21)
Lean 202–Advanced Value Stream Mapping (F22)
Comparative Cutting with Waterjet Cutting Advancements (F23)
Waterjet Cutting Advancements (F23)
Laser 101 (F24)
Roll Forming for Construction Industry (F25)
Tool Steel Friction Management (F26)
Laser Safety in Manufacturing (F27)
Understanding Sheet Metal Stamping Springback (F28)
Hydroforming Today (F29)

12:00 – 1:00 pm
Free Business Seminar:
Selecting Lean Building Blocks (B1)
During the AWS Opening Session and 88th Annual Business Meeting, 2007 AWS will be on hand to address the strategies, challenges and solutions to building a large manufacturing and research facility as it transitions from a self-performing to a highly competitive and responsive to its customers.

• Overview of a contracting strategy for new construction and maintenance work at a large manufacturing facility as it transitions from self-performing to a highly competitive and responsive to its customers.
• Mechanizing field welding procedures and the use of incentives to enhance welding productivity for field construction.

While at the pavilion, you’ll also want to visit employment service providers who will be on-hand to offer their support and assistance in workforce development and other employment-related opportunities.

Sunday, November 11

FABTECH International & AWS Welding Show Opening Ceremony

11:00 AM
A short, symbolic ceremony opens the FABTECH International & AWS Welding Show, the largest trade show and educational conference for the metal forming, fabricating and welding industries.

Monday, November 12

Leadership Summit: Addressing the Shortage of Skilled Workers

8:00 AM – 9:00 AM
Key representatives from our nation’s government as well as the manufacturing sector will be on hand to address the strategies, challenges and solutions to building a competitive manufacturing workforce. See the detailed description on page 18.

AWS Opening Session & Annual Business Meeting

9:00 AM
During the AWS Opening Session and 88th Annual Business Meeting, 2007 AWS President Gerald D. Utratchi will give the Presidential Report and Gene E. Lawson will be inducted as AWS President for 2008. Following the induction, the 2007 Class of AWS Counselors and Fellows will also be introduced. This meeting is open to all AWS Members and Show registrants.

Comfort A. Adams Lecture

A New Path to Probe Weld Microstructure Evolution Using Synchrotron Radiation
10:30 AM – 11:30 AM
Dr. John W. Elmer, Acting Program Element Leader, Stockpile Materials and Joining in the Chemistry & Materials Science Directorate of Lawrence Livermore National Laboratory, is this year’s Adams Lecturer. The Comfort A. Adams Lecture is named after the Founder and First President of AWS. This annual lecture is made by an outstanding scientist or engineer, honored by the AWS Board of Directors.

Image of Welding Award Ceremony

11:15 AM
Join the Image of Welding Committee (a subcommittee of the Welding Equipment Manufacturers Committee) and special guests as they recognize the individuals and organizations that have excelled in promoting the image of welding in their communities. Please RSVP by October 15 to Adrienne Zalkind at (800) 443-9353, ext. 416, or email to azalkind@aws.org.

AWS Officers/Presidents/Counterparts Reception

Chicago Hilton & Towers Hotel International Ballroom
6:30 PM – 8:00 PM
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 is included, along with a cash bar. Evening business attire, please.

Tuesday, November 13, 2007

AWS National Nominating Committee – Open Meeting

2:00 PM – 3:00 PM
AWS Members are requested to submit their recommendations for National Officers to serve during 2009. 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.

End User Forum

9:00 AM – 11:00 AM
FREE • Registration Code: W88
Speakers: John Matthews, Senior Welding Engineer, Welding and QA Technology, CB&I, Plainfield, IL; Guy Mulee, Manufacturing Engineering Manager, Baldor Dodge Reliance, Clio, SC; Mark Combs, President, Combs Welding Design, Inc., Winter Haven, FL.

This forum has been created to bring together the end-user welding community for a one-of-a-kind, content-rich productivity learning experience. The session will allow you to engage in provocative discussions with your peers, away from the office or shop floor.

Presenters will cover real-life productivity issues, including:
• Mechanizing field welding procedures and the use of incentives to enhance welding productivity for field construction.
• Overview of a contracting strategy for new construction and maintenance work at a large manufacturing and research facility as it transitions from a self-performing to a majority contracting organization.
• What one welding shop has done to increase its throughput and efficiency.
• How contractors are qualified, HSE requirements, quality control, and project management.
• What a small job shop has done to eliminate its reliance on suppliers, to be more competitive and responsive to its customers.
Global Improvement of Life through Welding

11 AM – Noon
FREE
Chris Smallbone, president of IIW (International Institute of Welding), will address IIW’s vision of improving human conditions worldwide through welding technology, as well as the need for international bodies to cooperate for the benefit of developing nations, nations with economies in transition, and developed nations. Successful models used in various countries, particularly for technology diffusion, education and training, the use of appropriate technologies, and conformity assessment, will be shown to be of benefit in meeting global challenges.

AWS Awards/AWS Foundation Recognition Ceremony & Luncheon
Noon – 1:30 PM
Price: $30 for members & nonmembers
The first AWS award, the Samuel Willie Miller Memorial Medal, was presented to Comfort A. Adams in 1927. 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 and luncheon is $30, and it is open to all registrants. For advance reservations, register on-line at www.aws.org/show and click on the “Register” button. You must register for this event separately from the full Show program. Tickets will also be available at the door.

Thermal Spray Seminar
Introduction to Thermal Spray Coating Processes
1:00 PM – 5:00 PM
FREE • Registration Code: W99
Instructors: Frank Hermance and Ed Simonds
From the application of zinc and aluminum to steel structures and the protection of welds on galvanized and aluminized steel, to the application of stainless steel to pump and valve components that will see chemical exposure, thermal spray has broad application in protecting a range of substrates from corrosion.

The seminar will present a three-part overview of these thermal spray coating processes:
• Molten metal flame spraying
• Powder flame spraying
• Wire flame spraying
• Ceramic rod flame spraying
• Detonation flame spraying
• High velocity oxyfuel spraying (HVOF)
• Cold spraying
• Plasma spraying
• Electric arc spraying
• RF plasma spraying

Wednesday, November 14

Prayer Breakfast
7:45 AM – 8:45 AM
Lift your spirits with fellowship, a good breakfast, and a prayer in this nondenominational gathering. The cost for attending the breakfast is $20, and is open to all registrants. For advance reservations, register on-line at www.aws.org/show and click on the “Register” button. You must register for this event separately from the full Show program. Tickets will also be available at the door.

R. D. Thomas, Jr., International Lecture
The Need for Common Standards in a Global Economy
10:00 AM (American Council of IIW meeting immediately following lecture at 10:30)
Dr. David Shackleton, Chair of IIW Select Committee on Standardization and President, ISO3834.com Ltd., is this year’s lecturer. The R. D. Thomas, Jr., International Lecture award was created to honor R. D. Thomas, Jr. for his participation in IIW/ISO activities and is presented by AWS to an individual who is also involved in IIW/ISO international activities. The recipient is invited to deliver a lecture that illustrates the incorporation of global standards in the standardization of welding technology during the AWS Welding Show and at the Annual Assembly of the IIW.
Leadership Summit
How is our nation addressing the skilled welder shortage?

Panelist: Anthony Swoope, Administrator, Office of Apprenticeship Employment and Training Administration, U.S. Department of Labor

Anthony Swoope became Administrator of the Office of Apprenticeship in 1999 with the reorganization of the Employment and Training Administration. He has held positions as the Director of the Bureau of Apprenticeship and Training, Ohio State Director, as an Apprenticeship and Training Representative, an Apprenticeship Instructor at Owens Technical College, and Director of the Akron Urban League's Apprenticeship Outreach Program, where he received national recognition for collaborative efforts with the Akron Public School's Career Education Program. A native of Akron, Ohio, Anthony graduated from the Sheet Metal Apprenticeship Program and received his formal education from the University of Akron and the University of Toledo.

Panelist: Dan Swinney, Executive Director, Chicago Manufacturing Renaissance Council

Dan worked for 13 years as a machinist in the Chicago area. He organized Steelworker Local 8787 at G+W Taylor Forge in Cicero, Illinois, and served as vice president. In 1982 he founded the Center for Labor and Community Research (CLCR), a not-for-profit consulting and research organization that specializes in developing innovative and effective approaches to community and business development, industrial job retention, and workforce education. Dan also directs the Chicago Manufacturing Renaissance Council (CMRC), a federation of business, labor, educational, and governmental leadership that provides oversight and coordination of a variety of manufacturing workforce projects aimed at distinguishing Chicago as an international hub for high-performance manufacturing. In addition, Dan serves as Project Manager for Chicago's Austin Polytech Academy. This school prepares students for careers in high-tech production positions, management, and ownership in manufacturing. Dan earned his B.A. degree from the University of Wisconsin.

Panelist: Jim Reeb, Director of Manufacturing R & D, Caterpillar

Over his 33-year career, Jim has managed all functions within Operations, Logistics and Procurement and managed product engineering groups who design powertrain components. In Jim's current position, he is responsible for the development and deployment of Manufacturing Processes and Technology. Jim is also the Global Process Owner for Manufacturing Engineering, Manufacturing Production Execution, and Manufacturing Support Process. He is also a member of SME, APICS and ASQ, on the Board of the Illinois Council on Economic Education, past chairman of the Valley Industrial Association, and on Governors State University's Advisory Board. He has completed a 4-year manufacturing apprentice program and earned a bachelor's degree from the University of St. Francis, and an MBA from Governors State University.

It is one of the most important issues affecting our industry today, and the situation continues to wreak havoc on our nation's manufacturing and construction industries. The shortage of skilled workers has been a cause for stress for businesses across America and in many parts of the world. A retiring workforce that makes up about half of the industry today, coupled with a lack of young people entering the fabrication and welding fields, has created an extremely challenging production environment for manufacturers. Media reports across the country document regional shortages that are forcing employers to take unprecedented measures to complete projects. Consequences of the skills shortage can be severe operationally and are already emerging across several critical industries where fabrication and welding employees are integral to the manufacturing and construction fields. These include national security and defense, energy production, transportation, steel construction, auto production, shipbuilding, metal fabrication, aerospace, and more. In addition, America's aging infrastructure, much of which was constructed throughout the 1950's and 1960's, must be renovated and rebuilt to support and protect our growing population.

This provocative summit will join together, for the first time, key representatives from our nation's capital and manufacturing sector, who will reveal relevant strategies and long-term approaches to building a competitive manufacturing workforce in a challenging recruiting environment. This is a must-attend event for anyone involved with operations or production in the manufacturing industry. Experts and stakeholders will be on hand to address the strategies, challenges and solutions to building a competitive manufacturing workforce.

Moderator: David Hanson, Commissioner, Mayor's Office of Workforce Development, Chicago

Since 2005, David Hanson has served as Commissioner of the City of Chicago Mayor's Office of Workforce Development. He also serves as co-chair of the Chicago Manufacturing Renaissance Council (CMRC), has worked on initiatives to help provide businesses with assessment of workforce needs, has worked to expand training beyond the bounds of conventional city college programs toward more industry specific certifications, and has brought about an alignment of local education and training that will provide not just jobs but careers in high-tech, high-road manufacturing.
AWS Committees
Open-to-the-public meetings of the volunteer committees and board of the American Welding Society.

Sunday, November 11

AWS Foundation (C)
7:45 AM

ASH Subcommittee on Filler Metals and Fluxes for Brazing (C)
1:00 PM – 5:00 PM

Districts Council (C)
1:30 PM

C7B Subcommittee on Electron Beam Welding and Cutting (C)
2:00 PM – 5:00 PM

C7 Committee on High Energy Beam Welding and Cutting (C)
5:00 PM – 6:00 PM

Monday, November 12

D17 Committee on Welding in the Aircraft and Aerospace Industries and D17 Subcommittees (C)
8:00 AM – 5:00 PM

C3 Committee on Brazing and Soldering and C3 Subcommittees (C)
8:00 AM – 5:00 PM

Opening Session & Annual AWS Business Meeting (C)
9:00 AM

C1 Committee on Resistance Welding (C)
1:00 PM – 4:00 PM

D14G Subcommittee on Welding of Rotating Equipment (C)
1:00 PM – 5:00 PM

Educational Scholarship Committee (H)
3:00 PM

Tuesday, November 13

D16 Committee on Robotic and Automatic Welding (C)
7:30 AM – 9:00 AM

D17 Committee on Welding in the Aircraft and Aerospace Industries and D17 Subcommittees (C)
8:00 AM – 5:00 PM

J1 Committee on Resistance Welding Equipment (C)
9:00 AM – 12:00 PM

PACW/POCWA (C)
10:00 AM

G2C Subcommittee on Nickel Alloys (tentative) (C)
10:00 AM – 11:30 AM

B1 Committee on Methods of Inspection (C)
1:00 PM – 5:00 PM

D18 Committee on Sanitary Applications (C)
1:00 PM – 5:00 PM

Wednesday, November 14

C3 Committee on Brazing and Soldering and C3 Subcommittees (C)
8:00 AM – 5:00 PM

D15C Subcommittee on Track Welding (tentative) (C)
8:00 AM – 5:00 PM

American Council of the IIW (C)
Preceded by Thomas Lecture at 10:00 AM
10:30 AM

Standards Council (H)
Professional Development Council (H)
Communications Council (H)
Role and Missions Committee (H)
Board of Directors – Day 1 (H)
2:00 PM – 7:30 PM (rolling meeting format)

Thursday, November 15

Board of Directors – Day 2 (H)
8:00 AM

O6 Committee on Friction Welding (H)
8:00 AM – 12:00 PM

Key:
(H) = Chicago Hilton & Towers
(C) = McCormick Center
Don’t Miss the Happenings in McCormick’s North Building!

Looking for that special spark to shift your career and business into overdrive? Don’t forget to visit the North Building at the Fabricator’s FABTECH Int’l & AWS Welding Show. With a wide variety of interesting offerings, from interactive welding displays to networking opportunities, the North Building promises to deliver an exciting and valuable experience. And this year, we have put together the “best in show” to make a visit through the North Building a can’t-miss opportunity.

To begin your journey through the North Building, you will have an exclusive opportunity to meet the men and women who drive the news engine of the welding, metal, and fabrication industries. Representatives from leading trade magazines, such as Fabricating & Metalworking Magazine, Welding Journal, and Tube & Pipe Tech Magazine will be available to give you a glimpse into the news industry while offering up trade secrets on how to spread the word about your business and products.

But there are not the only VIPs you need to connect with while visiting the North Building this year. Make sure to stop by the booths of the associations and other groups who support these dynamic and changing industries so you can be sure you are kept in the epicenter of it all. These important contacts include the American Welding Society, the Society of Manufacturing Engineers, the Fabricators and Manufacturers Association, the Resistance Welding Manufacturing Alliance, the Welding Equipment Manufacturers Committee, the National Association of Manufacturers, and the Chinese Mechanical Engineering Society.

In addition, the North Building will feature the Job Fair & Workforce Development Pavilion. Whether you are a veteran professional or student just entering the workforce, this comprehensive career expo guarantees a once-in-a-lifetime opportunity to meet company representatives on the hunt for prospective employees. Learn about exciting new industry jobs, and perhaps land a personal interview — just don’t forget to dress appropriately and bring your résumé. And if you haven’t nailed down a potential career path, or if you need some further direction and information on specific careers, there will be employment service providers and key associations on-hand to offer their personal support and assistance.

Sounds great, right? Well, that’s not all. In fact, we have only touched the surface of the exciting features the North Building has to offer.

Scared of a little competition? If so, be very afraid of the North Building. It will house this year’s Professional Welders Competition. You, your colleagues, and friends can go head-to-head to find out who has what it takes to be the best welder in the world. You can participate or watch from the sidelines as these pros fight till the bitter end for a $2,500 grand prize as they undergo a rigorous challenge to make the perfect simulated beam-to-beam weld. The top 12 competitors will win an AWS duffel bag. Each participant will receive an AWS Professional Welders Competition T-shirt. For more information about the Professional Welders Competition, including complete competition rules and safety rules, please visit www.aws.org/competition.

So you think that’s enough excitement for one location? Well, you haven’t seen anything yet!

Whether you need a tune up on your welding performance or just want to watch the experts at work as they showcase the latest and greatest in welding and cutting products, the ESAB team will park their ESAB Solutions Demo Trailer in the center of all the action. There, you will learn from the experts on how to save time and money, get the most out of your welding and cutting equipment, and achieve better end results. See for yourself through practical, hands-on demonstrations with the ESAB crew and get your toughest questions answered.

Also rolling into town will be the Miller Electric Welding and Cutting Road Show™. Miller took welding directly to the customer when the company launched this roaring exhibit, a 62-foot semi equipped with the latest welding power sources and systems. Not only will you be able to see Miller’s products in action, you will have an opportunity to test them out yourself. And with one of the largest variety of welders and welding processes ever displayed in a mobile unit, it is a must-see at this year’s show.

While we have covered a few of the North Building highlights, we just can’t capture all of the excitement and amazing opportunities it has to offer. Take it from us — and don’t be the last to find out what everyone is talking about.

Go north—visit McCormick Place’s North Building and explore new territories.
General Attendance Information

Convention Center
McCormick Place
2301 South Lake Shore Drive
Chicago, IL 60616

Show Hours
Sunday, November 11: 11:00 a.m.–4:00 p.m.
Monday, November 12: 9:00 a.m.–5:00 p.m.
Tuesday, November 13: 9:00 a.m.–5:00 p.m.
Wednesday, November 14: 9:00 a.m.–3:00 p.m.

Registration Hours
Sunday, November 11: 9:30 a.m.–3:00 p.m.
Monday, November 12: 8:00 a.m.–4:00 p.m.
Tuesday, November 13: 8:00 a.m.–4:00 p.m.
Wednesday, November 14: 8:00 a.m.–2:00 p.m.

Show Visitor Age Requirements
The FABTECH International & AWS Welding Show is a trade event and open only to industry professionals. No one under 16 will be admitted.

Student Registration
Technical students are welcome at the Exposition. If students and their instructors pre-register at least 2 weeks prior to the event, show admission is FREE. Guidelines for instructors and students can be found on the Web at www.fabtech.org/Attendees/Student-Attendance.cfm

Questions about student registration should be directed to the show’s registrar:
Lori Poole
Telephone: (312) 425-3147
Fax: (312) 425-3407
Email: lpoole@sme.org

Special Airfare Discounts
Call (800) 521-4041 for details on special airfare discounts available on United Airlines, the show’s official airline. To receive the greatest discount off the lowest air fares, we recommend booking early and using reference ID number #565HM.

Transportation from Chicago O’Hare International Airport
There are a number of ways to get to and from O’Hare International Airport, which is located just 17 miles northwest of downtown Chicago. Most ground transportation access areas are located at the main entrance for each terminal.

Taxi—Taxicabs are available on a first-come, first-served basis from the lower level curbfront of all terminals. Shared ride service is available. There are no flat rates because all taxicabs run on meters. Expect to spend approximately $55 to $40 for a taxicab ride to downtown Chicago. For wheelchair-accessible vehicles, please call United Dispatch at (800) 281-4466.

Limo Service—Approximate cost is $100 to downtown Chicago.

Airport Express Shuttle Service—Provides transportation to/from the Hyatt Regency McCormick Place Hotel (which is connected to the convention center) at a service fee. For more information please contact Airport Express at 888-284-3826 or on the web at www.airportexpress.com.

RTA—The Regional Transportation Authority (RTA) manages the 3 public transit operations in northeastern Illinois: The Chicago Transit (CTA), Metra commuter rail, and Pace suburban bus. For information on routes and schedules, contact the RTA via their website at www.transit.org or call their Transit Information Hotline at 312-836-7000.

Parking
McCormick Place has two parking garages, one located near the South Building and one located in Lakeside Center. The current charge is $16 per day regardless of the length of stay. The Hyatt Regency McCormick Place Hotel, which is connected to the convention center, also has a parking garage with an hourly rate. You may contact them at 312-567-1234 for details. Handicap accessible parking is available in Lot A (located on Martin Luther King Drive), Lot C (located underground in Lakeside Center), and the Hyatt Regency McCormick Place parking garage.

Hotel Information
The Chicago Hilton & Towers has been selected as the AWS Headquarters for the 2007 Show. Rooms will be available at special rates for FABTECH International & AWS Welding Show exhibitors and attendees.

Below are all participating hotels where rooms are available at a special rate. Shuttle service between the hotels and the convention center will be available only from these hotels.

**Hotel Rates**
By reserving your hotel accommodations in the official FABTECH International & AWS Welding Show room block, you are guaranteed to get the best rates (if you find a lower rate, let us know!).

Free shuttle service between the hotels and the convention center will be available only from these hotels.

**Best Western Inn Chicago**
$149 single/double

**Conrad Chicago**
$275 single/double

**Courtyard by Marriott Downtown**
$199 single/$219 double

**Courtyard by Marriott Chicago Mag. Mile**
$181 single/double

**Embassy Suites Chicago Downtown**
$188 single/double

**Embassy Suites Lakefront**
$199 single/double

**Essex Inn**
$139 single/$149 double

**Fairmont Hotel**
$289 single/double

**Hard Rock Hotel**
$249 single/$299 double

**Hilton Chicago**
$188 single/$198 double

**Hilton Garden Inn**
$179 single/double

**Hyatt Regency Chicago**
$199 single/double

**Hyatt Regency McCormick**
$222 single/$247 double

**Intercontinental Chicago**
$179 single/double

**Marriott Downtown Mag. Mile**
$199 single/$219 double

**Palmer House Hilton**
$205 single/$220 double

**Sheraton Chicago**
$182 single/double

**Wyndham Chicago**
$219 single/double

Hotels sell out quickly, so book early! Make hotel reservations online from any of the show sponsors’ Web sites, or call the FABTECH International & AWS Welding Show housing agency at (800)974-9833 or (847) 282-2529 (outside the U.S.) Monday–Friday, 8:00 AM – 5:00 PM CST.

Directions to McCormick Place (Parking Lot A)

FROM O’HARE INTERNATIONAL AIRPORT, NORTHWEST OR THE NORTH: Follow I-190 East to I-90 East. This turns into I-90/94 East (Dan Ryan Expressway). Keeping to the right, follow to I-55 North (Stevenson Expressway). Exit at Martin L. King Drive (Exit #293D) and follow signs to Lot A.

FROM THE WEST: Take I-290 East (Eisenhower Expressway) to I-94 East (Dan Ryan Expressway). Keeping to the right, follow to I-55 North (Stevenson Expressway). Exit at Martin L. King Drive (Exit #293D) and follow signs to Lot A.

FROM MIDWEST AIRPORT OR SOUTHWEST: Take I-55 North (Stevenson Expressway). Exit at Martin L. King Drive (Exit #293D) and follow signs to Lot A.

FROM THE SOUTH OR INDIANA via I-290: From I-290, exit at I-94 West (Bishop Ford Expressway) and proceed on I-94 West (Dan Ryan Expressway). Follow to I-55 North (Stevenson Expressway). Exit at Martin L. King Drive (Exit #293D) and follow signs to Lot A.

FROM INDIANA-SKYWAY: Take I-90 West (Indiana Tollway turns into the Chicago Skyway). Merge onto I-90/94 West (Dan Ryan Expressway). Exit at I-55 North (Stevenson Expressway). Exit at Martin L. King Drive (Exit #293D) and follow signs to Lot A.

FROM NORTH LAKE SHORE DRIVE (US-41): From Lake Shore Drive, exit at 31st St. and turn right (West). Turn right again on Martin L. King Drive and follow signs to Lot A.

FROM SOUTH LAKE SHORE DRIVE (US-41): From Lake Shore Drive, exit at 31st St. and turn left (East). Turn right on Martin L. King Drive and follow signs to Lot A.

FROM CONGRESS PARKWAY: From Congress Parkway, turn right onto Michigan Ave. Proceed South to Cermak Rd. (E. 22nd St.). Turn left on Cermak Rd. Then turn right immediately onto Prairie Ave. and follow signs to Lot A.

See Chicago
After show hours, enjoy your stay in Chicago, a world-class destination that offers something for every taste and every budget, whether it’s spectacular live theatre, energetic nightclubs, or awe-inspiring architecture. For information on what to see and do in Chicago, log on to www.meetinchicago.com.
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Leading the Way
AWS is the premier professional/technical society in welding, joining, brazing, soldering, cutting, and thermal spraying worldwide. It exists to advance the science, technology, and application of these disciplines from factory floor to high-rise construction, and from military weaponry to home products. Since 1919, AWS has led the way in support of welding education and the development of welding technology.

Join Us
The essential membership organization for the welding and joining industry, AWS has more than 50,000 individual members and more than 1,500 corporate members worldwide. Its steady and consistent growth promotes the image of welding in the marketplace and amplifies the voice of the welding community. As a member, you’ll share in outstanding benefits that include discounts on AWS publications. For more information about AWS membership and member benefits, visit www.aws.org/membership.

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As an AWS member, you’ll affiliate with one of more than 150 local Sections around the world. Choose the most convenient Section for you. Sections typically meet monthly, offering top-notch speakers, technical tours, and opportunities for new professional contacts.

Technical Information and Resources
Welding Journal
All AWS members receive the monthly Welding Journal, a major professional and technical magazine. It offers news and feature articles on practical and applied welding technology, peer-reviewed welding research, new products, developing technologies, safety, advertisements, and AWS activities and programs. The world’s premier welding publication, it has won more than 65 editorial and design awards.

Inspection Trends
Inspection Trends—a quarterly magazine for materials inspection and testing personnel—is mailed to individuals and facilities certified by AWS, including all Certified Welding Inspectors (CWIs). It deals with all aspects of nondestructive examination, and covers new technology, trends, issues, safety, and basic methods.

Standards
Under strict American National Standards Institute (ANSI) procedures, AWS has developed more than 230 consensus-based standards (including codes, product specifications, recommended practices, methods, and guidelines) for welding and allied processes. AWS’s flagship standard, the AWS D1.1/D1.1M, Structural Welding Code—Steel, updated every other year, is one of the world’s most consulted codes. To enhance the welding environment, AWS ensures timely dissemination of safety documents, including ANSI Z49.1-2005, Safety in Welding, Cutting, and Allied Processes.

Best-of-Industry Technical Publications
AWS offers over 300 books, charts, replicas, and proceedings. Included are the Welding Handbook series, the 18th edition of Jefferson’s Welding Encyclopedia, and single-author publications such as the renowned Welding Metallurgy. The serious welding professional will find The Professional’s Advisor series and The Practical Reference Guide series of incalculable value.

Online Access and Worldwide Reach
Thousands of members and visitors use the AWS Web site—www.aws.org—every month. Within a secure environment, you can view the latest welding news, renew membership, select books and standards, read classified ads, check an events calendar, ask and answer questions in real time, download free safety and health fact sheets, and more. The opportunities are extensive and continue to grow.

Serving on an AWS Committee
Over 1,400 professionals serve on more than 200 technical committees working under ANSI rules to develop consensus standards used by thousands of companies in the U.S. and elsewhere. AWS is accredited by ANSI to publish American National Standards on welding. AWS also administers the U.S. technical advisory groups (TAGs) to ISO/TC 44, Welding and Allied Processes, and most of the ISO/TC 44 subcommittees; and is an applicant Authorized National Body to the International Institute of Welding (IIW). In addition, AWS holds the secretariats of two ISO/TC 44 subcommittees and a number of working groups.

You can help to influence national and international standards by supporting participation on an AWS committee or ISO TAG, or by enlisting in the AWS-sponsored American Council of IIW, an important and prestigious body.

Education and Professional Development
AWS sponsors international, national, and local conferences and seminars featuring recognized experts. Subjects range from the basics to the most recent advances in technology. AWS members receive a substantial discount.

Other AWS initiatives to support welding education and research at all levels include individual corporate programs, study guides, and the award-winning Schools Excelling through National Skills Education (SENSE) program offered to all qualified U.S. welding-education groups.

AWS Certification
AWS develops and administers a variety of certification programs for welding professionals to help industry identify qualified personnel and provide individuals with meaningful career objectives. The most successful of these programs is the AWS Certified Welding Inspector program. With more than 21,000 inspectors currently certified and over 47,000 certified since 1979, the AWS CWI program has become the gold standard to define welding quality and has enhanced the careers of many thousands of welding professionals. AWS also certifies welders, welding testing facilities, educators, engineers, and robotic arc welding technicians. New programs include a productivity-based certification for welding supervisors and a program to define a best practice for interpreting weld radiographs.

AWS Foundation
The AWS Foundation supports research and education in welding and related technologies. Programs include scholarships to welding students attending technical schools or universities, research funds for graduate engineers, and promotion of the career opportunities within the welding industry. For the 2007-2008, school term, more than $300,000 is being distributed to approximately 300 students. Call (800)443-9353, ext. 351, for additional information, or visit the Foundation in Booth #36005. You can help by donating to the “Welding for the Strength of America” Capital Campaign or the Welder Workforce Development Program.

Networking
The American Welding Society is a partner in the FABTECH International & AWS Welding Show, the premier display of welding, joining, cutting, and allied technologies; metalworking, forming, and fabricating; and tube and pipe manufacturing technology available in North America. Produced by AWS, the Society of Manufacturing Engineers, and the Fabricators and Manufacturers Association International, this annual mega-event brings together thousands of professionals and hundreds of exhibitors. In conjunction with this trade show, AWS presents its Professional Program for researchers; dozens of seminars, roundtables, lectures, and special events; AWS governance meetings; and the AWS Book Store, offering special Show and member discounts on an extensive array of AWS publications.
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   4 □ Manufacturing Production   5 □ Welding Management
   6 □ Welding Engineer   7 □ Welder, Welding Operator
   8 □ Welding Distributor   9 □ Inspector/Tester
   10 □ Product Design & Development
   11 □ Purchasing   12 □ Sales/Marketing
   13 □ Educator/Student   14 □ Other

3. Check the number of employees at your facility:
   0 □ Less than 20   1 □ 20–49   2 □ 50–99
   3 □ 100–249   4 □ 250–499   5 □ 500–999
   6 □ 1,000–2,499   7 □ 2,500 and Over

4. Indicate the products or services you plan to evaluate at the show:
   A □ Arch Welding   B □ Assembly   C □ Bending & Forming
   D □ Brazing & Soldering   E □ Business Services
   F □ Coil Processing   G □ Cutting
   H □ Fastening & Joining   I □ Finishing
   J □ Gases & Gas Equipment   K □ Hydroforming
   L □ Inspection & Testing
   M □ Job Shop/Contract Mfg.   N □ Lasers
   O □ Lubrication   P □ Maintenance & Repair
   Q □ Material Handling   R □ Metal Suppliers
   S □ Plate & Structural Fabricating   T □ Press Brakes
   U □ Punching   V □ Resistance Welding
   W □ Robotics   X □ Safety & Environmental
   Y □ Saws   Z □ Software, Machine Controls
   AA □ Stamping   BB □ Thermal Spraying
   CC □ Tooling   DD □ Tube & Pipe Fabricating or Welding
   EE □ Tube & Pipe Producing   FF □ Welding Consumables
   GG □ Other Welding Machines   HH □ Workholding/Positioners

5. Indicate your company’s total budget for these products or services during the next 12 months:
   A □ Up to $20,000   B □ $20,001–$50,000
   C □ $50,001–$200,000   D □ $200,001–$500,000
   E □ $500,001–$1,000,000   F □ $1,000,001–$5,000,000
   G □ Over $5,000,000

6. Indicate your purchasing authority:
   A □ Evaluate/Recommend   B □ Specify
   C □ Approve   D □ No Role

7. Check the primary industry your company serves:
   A □ Agriculture/Landscaping Equipment   B □ Aircraft/Aerospace
   C □ Automotive   D □ Rail
   E □ Shipbuilding/ Marine   F □ Other Transportation
   G □ Architectural Engineering   H □ Construction
   I □ HVAC   J □ Appliance
   K □ Consumer Products   L □ Electronics/Computers
   M □ Furniture   N □ Chemical & Petroleum
   O □ Government/Military   P □ Industrial/Commercial Machinery
   Q □ Mining/Utilities   R □ Fabricated Metal/Stamping
   S □ Other Manufacturing   T □ Education
   U □ Non-Manufacturing

Free Special Events

FREE AWS Programs
   □ (W86) AWS Education Program Tues., Nov. 13–Wed., Nov. 14 (p.12)
   □ (W87) Int’l Brazing & Soldering Symposium Tues., Nov. 13 (p.13)
   □ (W88) End User Forum Tues., Nov. 13 (p.16)
   □ (W89) Introduction to Thermal Spray Tues., Nov. 13 (p.17)
   □ (S1) Leadership Summit Mon., Nov. 12 (p.18)
   □ (J1) Job Fair Mon.–Tues., Nov. 13–14 (p.6)

FREE Business Seminars (p. 14)
   □ (B1) Selecting Lean Building Blocks Mon., Nov. 12
   □ (B2) Job Shop Marketing Tues., Nov. 13
   □ (B3) Workforce Performance Improvement Wed., Nov. 14

Some events require separate registration. To compete in the Professional Welder Competition, register onsite on Sunday afternoon or during the competition. To reserve for the Image of Welding Awards Ceremony, RSVP to azalkind@aws.org or (800) 443-9353 ext. 416. To register for the AWS Awards/AWS Foundation Recognition Ceremony & Luncheon, visit www.aws.org/show. To register for the Prayer Breakfast, visit www.aws.org/show or pay at the door.

Please call (800) 733-4763 if you require special assistance.
**PAID PROGRAMS REGISTRATION FORM**

Entry into the exposition is included in paid-event fee. If faxing this form to register, please fax both sides of page.

Please indicate your name and member number (if any) to receive full pricing benefits.

**NAME**

Name ____________________________________________

**COMPANY**

Company ____________________________________________

I am a member of:  □ AWS  □ FMA  □ SME  □ NAM  □ Nonmember  Member Number __________________________

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**AWS PROGRAMS**

**1-Day Seminars (p. 5)**

- AWS/FMA/SME/NAM Member $345; Nonmember $480*
- Road Map through the D1.1  □ (W71) Mon., Nov. 12
- Pricing and Profitability  □ (W72) Mon., Nov. 12
- Inspection to the 2006 D1.1  □ (W73) Mon., Nov. 12
- Visual Inspection Workshop  □ (W76) Tues., Nov. 13
- Metallurgy Applied to Everyday Welding  □ (W77) Wed., Nov. 14
- Introduction to MT, PT, UT and RT  □ (W78) Wed., Nov. 14

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**3-Day Professional Program***

AWS/FMA/SME/NAM Member $225; Nonmember $360*

- (W84) Mon.-Wed., Nov. 12-14 (p. 7)

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**RWMA Resistance Welding School**

AWS/FMA/SME/NAM Member $425; Nonmember $660*

- (W80) Tues. & Wed., Nov. 13-14 (p. 6)

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**2-Day Stainless Steel Seminar**

AWS/FMA/SME/NAM Member $550; Nonmember $685*

- Welding of Stainless Steels  □ (W79) Tues. & Wed., Nov. 13-14 (p. 5)

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**FABTECH TECHNICAL SESSIONS**

Please select the FABTECH Technical Sessions below you would like to attend. See page 14 for codes. The price for a multiple session purchase is noted at left, and is not combinable with AWS programs above. Do not register for more than one session in each time slot each day as sessions run concurrently. After Oct. 26 and on-site, add $25 to the purchase price of FABTECH Technical Sessions only.

- □ 1 Session  FMA/AWS/SME/NAM Member $165; Nonmember $185
- □ 2 Sessions  FMA/AWS/SME/NAM Member $295; Nonmember $345
- □ 3 Sessions  FMA/AWS/SME/NAM Member $385; Nonmember $465
- □ 4-5 Sessions  FMA/AWS/SME/NAM Member $655; Nonmember $765

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**SEE FREE PROGRAMS ON OTHER SIDE**

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**Payment**

Forms received without payment will not be processed. Payment due in U.S. Funds.

- □ Check enclosed (checks payable to SME)  Total amount due $__________
- □ Authorize charge to my credit account (Complete credit card information below)

CHECK ONE:  □ VISA  □ American Express  □ MasterCard  □ Discover

Name (Please print) ____________________________________________

Signature ____________________________________________

Credit Card Number ____________________________ Expiration Date ____________________________

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**Nonmember price for AWS Sessions includes a two-year AWS Individual Membership. Member benefits include a subscription to the Welding Journal, a 25% discount on AWS publications, membership in a local section, and more.

**Nonmember Student Professional Program price includes a one-year AWS Student Membership.

**Professional Program fee includes one copy of the Professional Program Abstracts. Additional copies are available to the public at the AWS Publications Booth (North Building, #38011) for $7.5.

**Cancellations must be made in writing and faxed to: FABTECH International & AWS Welding Show Conference Cancellation at (312)425-3407 no later than October 26, 2007 to receive a full refund. Cancellations received after this date are non-refundable.**
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