February 2016

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AWS Technical Nights are open to everyone! We encourage that members bring students and non-members to learn more about our organization and industry.

Follow Us awsdetroit.org

February 2016

Technical Presentation & Patrons' Night

Thursday, February 11, 2016

LOCATION: Valiant Machine & Tool Inc.
6161 Tecumseh Road East
Windsor, ON, Canada    N8T 1E7

Special Notes: Individuals who attend will require a passport or enhanced driver's license to cross the border.

The 2016 February Technical event is the annual Detroit Section Patrons’ Night, where we acknowledge the generous donations made by local companies and individuals in the Detroit Section. This year we will be recognizing 24 Patrons who have made over $10,700 in donations, all of which goes directly towards scholarships for students pursuing a welding related education in Detroit and the surrounding areas.

The February meeting will be a combined meeting between the AWS Detroit Section and the Canadian Welding Association - Southwestern Ontario Section. Valiant Machine & Tool Inc. will be hosting the event, their facility being within minutes of the Detroit/Windsor border. One of Valiant’s welding technologists, WeiJie Zhang, will cover the technical content for the evening with a presentation focused on Aluminum Joining Technologies. This will be followed by a quick facility tour.

Valiant Machine & Tool Inc. is a full service provider of automated production systems and tooling. Established in 1959, Valiant has 25 facilities in 12 countries, over 1300 employees and global sales in excess of $560 million annually. A few key customers include Ford, GM, FCA, Boeing, Caterpillar, Case New Holland, John Deere, and DAG. Some joining technologies that Valiant has implemented include resistance spot and projection welding, arc welding, seam tracking and inspection, self-piercing rivets, clinching, laser welding and brazing, gluing and automated gluing inspection and hemming (both roller and press).

continued on page 4

AGENDA

5:30-6:00pm – Welcome reception & Networking
6:00-6:45pm – Opening Remarks (AWS/CWA) & Meal
6:45-7:00pm – Patrons’ Awards – Eric Lichtfusz
7:00-7:30pm – Valiant Technical Presentation
7:30-8:00pm – Valiant Facility Tour
8:00pm – Adjourn
Welcome to February!

So far the winter has been pretty mild as the battle between the Polar Vortex and El Nino rages on. February is not just the month we remember our significant other with some flowers, gifts or candy, for the Detroit Section it is the month we honor those individuals and companies who are Patrons to the section. Eric Lichtfusz has been doing a great job with this and we have over 20 Patrons that contribute to the programs we provide such as Scholarships and our upcoming Education program. The section is hosting the educational program on Die Welding at Schoolcraft College. Please join us at Valiant Machine in February to honor those who help support the section activities. If you are interested in becoming a Patron, please contact Eric. He would gladly explain how you can become a Patron. As an FSU Alumni, I need to take a moment and ask my fellow alums if they would be willing to donate as Patrons for an FSU Welding Engineering Technology. The Alumni from OSU have had a fund for several years and I believe it is time we take similar action. I will throw in the first $10! Please contact me directly if I can count on you to participate doneth.wesley@fronius.com or 810-844-2800.

Best regards, Wes

Wesley Doneth
Chairman’s Message

Education Seminar -
Die Welding Seminar
March 2016!

Date: March 10, 2016
Location: Schoolcraft College VisTaTech Center
18600 Haggerty Hwy, Livonia, MI 48152
Agenda:
5:30-6:00pm – Welcome Reception & Networking
6:00-6:45pm – Opening Remarks & Meal
6:45–8:00pm – Seminar presented by Weld Mold Company
8:00pm – Adjourn

Event Info:
The 2016 March Technical event will be one of our Educational Series Nights. The seminar will focus on Tool and Die Welding which includes hard facing. Tool steels are a special category of steels and this company focuses on this area. David Lee, the Technical Director of Weld Mold Company will be our featured speaker.

This seminar counts toward your Professional Development Hours (PDH). Please visit www.aws.org for more information about Professional Development Hours.

Charge:
There is a $20 REFUNDABLE deposit to hold your place at this event. You will receive a refund when you sign in at the event. Students are FREE.

RSVP:
RSVP required by Monday, March 7, 2016. Please contact John Sutter for reservations – the seminar will be limited to 50 people. Email: johnsutter@comcast.net.
REGISTRATION

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ARE YOU INTERESTED IN DONATING A MAJOR RAFFLE PRIZE? **

(CHECK IF YES)

SPONSORSHIP OPTIONS AVAILABLE - CHECK WEBSITE FOR LATEST INFO OR CONTACT ANDRE YOUNG (586) 665-3692 andreyoung@kukarobotics.com

MGM Hotel rooms can be reserved at (877) 888-2121, ref. “American Welding Society Ladies Night 2016 Room Block”

* Tables (4 Couples) include Corporate / Company recognition

** All Gifts and Prizes are recognized in the Program, the Bulletin, and as awarded

*** This event supports our AWS Scholarship & Educational programs

REGISTRATION / PAYMENT TYPE

- CREDIT CARD (online) direct via LadiesNightRegistration

- NON-WEB CREDIT CARD
  Contact Andre Young (586) 665-3692 andreyoung@kukarobotics.com

- CHEQUE
  Fill out attached form, make Cheques Payable to AWS Detroit Section and mail to: Andre Young, 34209 Grove Drive, Livonia, MI. 48154

NAME ____________________________
COMPANY ____________________________
ADDRESS ___________________________
CITY ____________________________ STATE / PROV __________ ZIP / POSTAL __________
PHONE ____________________________
E-MAIL ____________________________

Questions? Contact Tyler Alexander: (519) 819-1716 tyler.alexander@cntrline.com
Calling all candidates for the 2016/17 Executive Committee Election!

Each winter the AWS Detroit Section Nominating Committee assembles a list of Candidates to prepare a ballot for an election that occurs in early April. To prepare for the election, the Nominating Committee is charged with assembling a roster listing a minimum of 8 candidates who represent the various segments of the welding industry.

Why Is this Process Important?

Quality Nominees are essential to the continued success of AWS-Detroit, which was chartered on February 3, 1925. With approximately 1,000 members, AWS-Detroit continues to thrive and host several nationally recognized activities, including Ladies Night and Sheetmetal Welding Conference. The objectives of AWS-Detroit include:

• The advancement of the science, technology and application of welding and allied joining and cutting processes, including brazing, soldering and thermal spraying;
• Support for, and provision of, educational opportunities related to welding and allied joining and cutting processes;
• Encouragement of the interaction of the local community of welding professionals, students, and users; and,
• Advancement of the image of welding.

Please contact Wesley Doneth at 810-844-2800 or doneth.wesley@fronius.com for more information. This is your opportunity to advance your involvement in one of the oldest and largest sections in the USA.

Welder Repair Technician

ICR is a single source solution provider of industrial component repair, products and services for manufacturing facilities and industrial automation systems. ICR is headquartered in Warren, Michigan with repair facilities in Canada, Mexico, and South Africa.

ICR is seeking an experienced component level Welder Repair Technician for Arc and Resistance welding equipment. Qualified candidates must have at least 3 years of component level welder repair experience.

Forward your resume to the Human Resources Manager at hr@icrservices.com. ICR is an Equal Opportunity / Diversity Employer

Did your company promote someone that needs recognition?

Maybe you’ve moved to a new location, or perhaps would like to advertise an open house or other event that would be of interest to our members? Employment opportunities? If you think it might be of interest or importance to our members and readers, please contact Russ Webster @ russ.webster@gm.com. Our typical cutoff date is the 15th of each month for the next month’s bulletin. Thank you~

Welder Training Scholarships

Welder Training Scholarships are available to AWS Districts to provide funds to students seeking welder training through a trade school, community college, or other facility providing welder training programs, such as Tulsa Welding School and Hobart Institute of Welding Technology; or for an AWS Certified Welder (CW) seminar.

February Hotline

Special Notes: Individuals who attend will require a passport or enhanced driver’s license to cross the border.

RSVP required by Tuesday, February 9, 2016. Please contact John Sutter for reservations. Email: johnsutter@comcast.net or Ian Cross Email: ian.cross@valiantmachine.com
Co-op Welding Students, Summer Interns and Part-time Welders
Contact Pat Bell: patricia.bell@detroitk12.org or (313) 282-8171 in Detroit

Obara USA has established itself as a premier supplier of high quality welding equipment and services. With our worldwide resources for equipment, research and development, and manufacturing, Obara USA can meet any project requirements, regardless of size or scope.

www.obarausa.com

Calendar of Coming Events
Auto21 Workshop Automotive Welding
University of Waterloo
Friday January 29 9-4

FabTech Canada
Toronto Congress Center
March 22 -24

AWS Scholarship Submittal Deadline
April 1

AWS Detroit Ladies Night
MGM Grand Detroit, MI
April 30
Industrial Laser Safety Officer • Novi, MI
Dates: February 17–18, 2016
Wed: 8:30AM to 4:30PM • Thur: 8:30AM to 4:00PM

Hosted at:

IPG Photonics Corporation, Midwest Operations,
46695 Magellan Drive, Novi, MI 48377

Description
A 2 day non-mathematical approach designed to teach the duties of Laser Safety Officer as described in the ANSI Z136.9 Safe Use of Lasers in Manufacturing Environments standard to users of industrial lasers. Information on lasers and optics, bioeffects, beam and non-beam hazards, control measures and training requirements are covered. Emphasis is placed on laser safety program development and administration. This course meets all LSO training requirements outlined by ANSI and OSHA and is worth 2.0 BLS CM points by the Board of Laser Safety.

Who Should Attend
Any personnel using an industrial laser for welding, cutting, drilling, marking or etching. This course is tailored to fit the needs of safety professionals, engineers, laser operators, technicians, and other professionals assigned the duties of a Laser Safety Officer who are not required to perform hazard analysis calculations.

What You’ll Learn
Experts from the Accredited Standards Committee Z136 Safe Use of Lasers provide up-to-date information on Federal, State and International laser safety regulations.

- Laser fundamentals and terminology
- Overview of MPEs, NHZs, ODs
- Laser bioeffects
- Laser control measures
- Selection of laser eye protection
- Laser safety program administration

Hotel: Holiday Inn Express Wixom
48953 Alpha Drive
Wixom, MI 48393
+1.248.735.2781

Staybridge Suites
27000 Providence Parkway
Novi, MI 48374
+1.248.349.4600

Crowne Plaza Detroit-Nov
27000 Karevich Drive
Novi, MI 48377
+1.248.348.5000

Make reservations directly with the hotel by phone or online. Use IPG corporate ID# 100202764.

Registration:
You may register for this course by going to the Laser Institute of America Website:
http://www.lia.org/store/course/ILSOMI0216

Fees:
$550.00 (LIA Member Price: $500.00)

Included in Registration Fees:
Course manual including a resource CD with useful LSO documentation forms, ANSI Z136.9 Safe Use of Lasers in Manufacturing Environments standard, LIA Laser Safety Guide and a certificate of completion.

Cancellation Policy
You may, at any time prior to 10 business days before your course begins, cancel your registration and receive a refund, less an administrative fee of $99. Within 10 business days of the course, the Laser Institute of America will not issue a refund. However, you can reschedule for a future course at no cost as long as you attend within the next 12-month period. Please be aware that if you cannot attend the course and fail to give proper notification prior to your course date you will forfeit your entire course fee.

For More information contact the LIA 1.800.34.LASER
Q: “In general, when should I use a water-cooled welding cable in place of an air-cooled one? It would seem that there are tremendous advantages to a water-cooled cable for dealing with the heat generated by welding.”

A: “If both the water-cooled and air-cooled secondary cables specified for an application have sufficient thermal capacity associated with them, why would one be concerned about their cross sectional area? This would be ok if your only concern was the Equivalent Continuous Thermal Current, or ECTC, associated with an application. However, in the world of resistive welding processes one must have enough voltage available to achieve the needed secondary current, and the way that is determined is by Ohm’s Law.

**Ohm’s Law**

At a constant temperature, electrical current (I) flowing through a fixed linear resistance (R) is directly proportional to voltage (V) and inversely proportional to resistance. This relationship is, in equation form: $I = \frac{V}{R}$.

Ohm’s Law is also denoted as $E = IR$. However, the usage of V (Potential Difference) instead of E will be used. Please keep in mind personal preference is the only difference; either variation will get you the correct answer. This also ensures E is not mistaken with Electrical Energy, which is measured in Joules (J).

Finally, the value for resistance will be replaced with a term that better captures the total opposition to current flow in an alternating current (AC) circuit - Impedance (Z), which takes into account both Resistance (R) and Inductive Reactance ($X_L$). The equation form becomes: $Z = \sqrt{R^2 + X_L^2}$. In a DC circuit, the Inductive Reactance component can essentially be ignored, unless you are concerned about rise rate. The brings us to the final form of Ohm’s Law that we will use for our discussion: $V =IZ$.

From our previous column we had the following example:

- Number of welds/min: 10
- Weld Time (cycles @ 60Hz): 20
- Base Current (Amps): 11000

350 MCM water cooled cable vs. 1200 MCM air cooled cable - 14” long secondary conductor cables for both types.

The resistance of a secondary circuit can be measured, but for our purposes, it will be estimated. Dependent on the assumptions one makes, it is not uncommon to see total resistance values ranging from $300-500 \times 10^{-6} \Omega$, or $300-500 \mu \Omega$. As an example, each connection may add 5-20 $\mu \Omega$, while the work between the electrodes can add 80-120 $\mu \Omega$ (steel). The transformer itself has a resistance as do the secondary conductors. For the examples above, the 350 MCM water cooled cable would be about 35-40 $\mu \Omega$ vs. 12-14 $\mu \Omega$ for the 1200 MCM air cooled cable. These numbers will vary a bit between AC vs. MFDC, and the various manufacturers, but for our purposes they are close enough.

**Assumption**: All of secondary circuit resistance in an MFDC application, less the actual cables is 400 $\mu \Omega$, and two cables are needed for the application. The best case for each application is as follows:

- 350 MCM water: $470 \mu \Omega$ [400 $\mu \Omega$ + 2 Cables @ 35 $\mu \Omega$ each]
- 1200 MCM air: $424 \mu \Omega$ [400 $\mu \Omega$ + 2 Cables @ 12 $\mu \Omega$ each]

$V = IZ$ (Ohm’s Law)

$V = 11.0 \text{kA} \times 470 \mu \Omega = 5.2 \text{ volts (350 MCM)}$  
$V = 11.0 \text{kA} \times 424 \mu \Omega = 4.6 \text{ volts (1200 MCM)}$

Now, what if all that was available was a 6.0 V secondary transformer?

- 5.2 volts / 6.0 volts = 87% (350 MCM)
- 4.6 volts / 6.0 volts = 77% (1200 MCM)

Therefore, using 1200 MCM air cooled cables vs. the 350 MCM water cooled cables reduces the demand on the transformer from 87% to 77%. This may not initially seem like a big deal, except if operating at or near 90% of the transformer’s capacity, it limits the ability to increase current by means of a stepper, or to account for other process variations.”

If you have more questions about this topic, Don can be reached at:

R&E Engineering Services  
A subsidiary of R&E Automated Systems, LLC  
17500 23 Mile Road – Suite B, Macomb, MI 48044  
(586) 228-1900 – Office  
(734) 793-2304 – Direct  
dmaatz@reautomated.com

William D. Ford CTC – AWS Student Chapter

We (William D. Ford CTC) took a tour of Magnacheck this past December. We had fifteen students come to this meeting. We toured their facility and Mr. Scott Bucholz spoke to our group about non-destructive testing and what is involved with it. Here are a few photos of our visit and tour.

This was a very interesting tour and I feel the students learned some things they didn't know.

Thank You,
Richard Randall
January Tech Meeting Recap

The AWS-Detroit section hosted its January Technical meeting at Camarc, in Westland, Michigan. AWS-Detroit section Chairman Wes Donneth was the MC for the event.

Camarc Technical Director, Ross Hughes shared his insights into “Alternate Welding Processes.” Specifically, Mr. Hughes focused on the use of the wire-feed GTAW process to make comparable welds to that of a wire-feed laser system. His presentation included both a video of production part assembly, including a unique automatic GTAW electrode changing system, and a live demonstration of the process.

Tom Graham, Manager-Key Accounts Group for ABICOR-BINZEL spoke about the breadth of other alternative welding processes in use. These included systems for seam tracking with both visual and tactical guidance systems. The presentation also included video that demonstrated the ability of the guidance system to account for relatively poor part fit-up by oscillating the laser beam in two directions. This same system also permits for edge-on seam welding so that narrower part flanges can be utilized, thus saving weight on the final product.

Check out the AWS Detroit section’s website and the Events page to view more photos from this event.

Editor’s Notes

As editor for the AWS Detroit Section e-bulletin, I’ve enjoyed reading and learning about the many activities, and opportunities that abound because of the support of the Detroit Section.

Did you know that there are opportunities for students, both high school and college to win scholarships to enter the wonderful world of welding? What about the scholarships that are funded by our group for those going into the field of weld education (ie: teachers, professors, etc.)? The latter scholarships can even be utilized by current educators wanting to return for more education.

I bet you didn’t know that at least once a year, our Detroit Section is allowed to fund one individual to go through the CWI training, which is typically hosted in the metro Detroit area by individuals affiliated with our Detroit Section.

The Detroit section also provides leadership, and assistance, both financially and volunteers to our student chapters. In the past, we have assisted young men in the boy scouts with earning their weld badges. We also aid in the local high school welding competitions by providing direction, judges, prizes, and scholarships to the winners. Some of these winners have gone on to be national and international winners of scholarships.

So, as you can see, we are not only a group of “weld-minded” individuals, but a gracious team that focuses on community and bringing a wealth of knowledge to our future.

It’s a fun group to belong to as well. There are fund-raising events such as the annual AWS Ladies Night, our annual Golf outing, and even the Christmas/Holiday party which raise money for our scholarship and education programs.

This month, we honor our Patrons. Those individuals, companies and groups that sponsor our scholarship and education programs. If you are a current Patron, you have our most gracious thanks! If you’d like to become a patron, Eric Lichtfusz is our Patrons contact, and would be most helpful in getting you started.

Finally, if you just want to be a part of all of this, consider joining our section! The investment is small, but it is definitely worthwhile, and something you can invest in yourself and in the future of the industry and community.

‘Til next month – Stay warm & KEEP ON WELDING!

Robin
I was sent to Kansas City, along with another team member from my company, to one of our customer sites to install a weld assembly line. We were so busy the whole time. Finally, we successfully put it through. We worked about 14 hours the last day, and I missed my lunch. We then took a group dinner at one grill buffet. I was so hungry that I buried my head working on anything edible on my plate. And suddenly, I felt the whole table was quiet and all the other co-workers laid eyes on me. I saw everyone looking at me with a look of surprise on their faces. Then, I realized I have already stuffed about 8 plates of meat in my stomach and my co-workers were surprised how a tiny, skinny Chinese guy can eat that much.

**What would you consider a “memorable” moment in your career or studies?**

My first intern project during my PhD program was to design a wireless remote control and data acquisition system. It was for a plasma welding process so that I could control, diagnose, and update the software of the control/power unit of the welding process located in the customer site while I sat in my lab. I worked four months on this project. As the first data stream retrieved back from the power unit miles away from my lab, I jumped out of my seat. I will never forget the satisfaction of knowing that I can do something real and bigger.

**Wow, that’s quite an accomplishment for a first project.**

**WeiJie, would you like to share anything with us that you would consider near/dear to your heart?**

My family, especially my wife and my parents. My parents sacrificed so much to support me all these years. They allowed me to grow up from the country side in China, have a fine education to university, without any financial concerns, and further study abroad in the USA. My wife married me when I was a poor student, and she’d deserved much better. I’m doing my best to make my family happy and proud.

**That’s truly inspiring and wonderful that you have not only had these opportunities allowed to you by your family, but that you are giving back to all of them, as well.**

**Most of us have been mentored by someone special, whether in school, or in our field of work. Is there anyone that you would like to acknowledge?**

I have been so fortunate to have known so many wonderful instructors during my career. They did their best to instill their knowledge and wisdom upon me. I want to point out three of my mentors: First, is my PhD advisor, Dr. YuMing Zhang who taught me to treat my study and research as part of my keeping and pursuing faith; Second, is my senior fellow colleague, Dr. Yi Huang, from whom I learnt to set up proper mentality for detailed work; Lastly, is my first supervisor at work, Mr. Ian Cross, who mentors me by action by displaying a high standard of work ethic, along with all the details in daily work.

**How did you get your start in welding?**

It was a total accident. I was targeting control system and theory for my PhD study at the beginning. And my advisor told me that he had a new four-year welding project for full circumference stainless steel pipe welding (Manual GTAW 5G position), and asked me if I was interested. I said “let me think about it”. One week later, my advisor told me that he had already set up a new office, lab equipment and account for me to step into that new project. So, I stepped in when I was still thinking about if I should step in. It turned out that I love dealing with welding issues, and the project went great.

**What do you see as the biggest challenge for the welding community in the future?**

For high volume automotive manufacturing, I think the biggest challenge is that the pace of welding technology evolving and adoption in manufacturing lags behind development of new material viable for auto body. There are a lot of innovative welding technologies available, perfect for new, lightweight material. Some of them have been implemented in automotive manufacturing in Europe or the rest of the world. But it would be years before they can be seen on the floor in North America.
WELDING SCHOLARSHIPS
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in
WELDING ENGINEERING,
WELDING ENGINEERING TECHNOLOGY
or
RELATED FIELDS with WELDING CONTENT

For students pursuing Post-secondary training or an Associate/Bachelor Degree in Welding Engineering or Welding Engineering Technology. These scholarships provide money to be used for the student’s tuition, books, or lab fees for one year. To be eligible for these scholarships, you must be enrolled in a certification-based program or two (2) or four (4) year engineering degree program in Welding, Welding Technology, or a related field. The program supports students attending schools in the state of Michigan and the following counties in the province of Ontario: Essex, Chatham-Kent, and Sarnia-Lambton.

An interactive PDF application form (with supplemental instructions) is now available on the AWS Detroit Section website www.awsdetroit.org

Application deadline for the 2016-17 academic year is April 1, 2016.
Scholarship Committee, AWS Detroit Section
P.O. Box 32952 • Detroit, MI 48232-0952

For 2015/16 the Section was able to award 32 scholarships totaling $45,500 to students from 8 different schools.
The most reliable, easy-to-use Gun Changer. Ever.

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A more reliable locking mechanism. 7,000 pounds of locking force guarantees that signals pass flawlessly, even with heavy accelerations and payloads.

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- Weight: 13.5 Kilograms (30 lbs)
- 600 Volt, 600 Hz
- 90 KVA @ 50% duty cycle
- Secondary max DC voltage of 70 Volts
- Water-cooled, 75 LPM minimum
- @ 30°C maximum inlet temperature

**TDC-7220**
- Weight: 15 Kilograms (33 lbs)
- 600 Volt, 1000 Hz
- 85 KVA @ 50% duty cycle
- Secondary max DC voltage of 10.6 Volts
- Water-cooled, 6 LPM minimum
- @ 30°C maximum inlet temperature

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