



American Welding Society®
DETROIT SECTION



FEBRUARY 2024

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Check out the latest videos published by the American Welding Society on its YouTube page.

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



AWS-Detroit Technical Meeting

Thursday, Feb. 8, 2024 • 5:30 - 8:30pm

Development of a Next Generation Resistance Spot Welding Cell Employing Medium Frequency – Frequency Converter Technology

LOCATION: GESTAMP R&D NORTH AMERICA

1600 Harmon Rd, Auburn Hills, MI 48326

Click here for **Google Maps**

Gestamp Contact: Steve Davis - 248-765-1890

Tour Following Technical Night Presentation

Speaker: Dr. Jerry E Gould

Senior Technology Leader,

Resistance and Solid-State Welding, EWI

RSVP by
Feb. 6th to:
Warren Peterson
wpeterson@
unitedtech1.com

Resistance spot welding is the cornerstone body-in-white assembly. The technology has been in widespread use for automotive construction dating back to the early 20th century. The process itself has evolved through a range of power supply types, controls, mechanical forcing systems, frame configurations, etc. Current state of the art includes medium frequency power supplies combined servo-drive force actuation systems. Through all this development, however resistance spot welding still retains challenges with energy efficiency, needs for cooling water, electrode tip degradation, etc. Over the last several years EWI has been working to demonstrate the advantages of high current – short duration pulse welding for addressing many of these concerns. Initial work was done applying polarity switching capacitor discharge power to address these concerns. More recently, EWI has developed an approach that allows creating capacitor discharge equivalent current pulses from medium frequency-based power supplies. In this discussion the background for this development will be described, examples of resulting power supply response presented, and on-going work integrating a full manufacturing cell employing this technology outlined.

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SMWC XX

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October 22-24, 2024 | Detroit, MI

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MORE INFORMATION
website: awssection.com/detroit/smw
email: DETROITSMWC@AWSSECTIONS.ORG

Please join the AWS Detroit Section and share your recent technical contributions. The SMWC XX is accepting papers related to welding and joining solutions for body construction, electrification, and the utilization of virtual validation tools. Selected papers will be invited to present their findings at the in-person conference.

ABSTRACTS DUE MARCH 1ST, 2024

BODY CONSTRUCTION | VIRTUAL VALIDATION TOOLS | ELECTRIFICATION

Battery Box Construction
Battery Welding
Dissimilar Materials Welding
High Gauge Ratio Stack-Ups

Material Considerations for Electrification
Mechanical Joining
Modeling of Weld Process and Attributes
Motor Welding
Next Generation of Materials

Non-Destructive Evaluation
Process Development
Utilization of AI/ML for Welding
Welding Equipment Innovations

2024 Ladies Night Scholarship Gala Detroit Section



WHERE: The Antheneum ***NEW VENUE***

WHEN: Saturday, April 13th, 2024 ***SAVE THE DATE***

LINK FOR REGISTRATION: <https://awssection.com/detroit/event-calendar/>



For more information, contact awsdetroitregistration@awsdetroit.org

Cocktails	6:00 pm - 7:00 pm
Dinner and Program	7:00 pm - 9:30 pm
Afterglow Dancing	9:30 pm - 12:00 am

**FOR OVERNIGHT RESERVATIONS
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<https://www.atheneumsuites.com/>

Upcoming Events

Thursday, Feb. 8 • 5:30 - 8:30pm

Speaker: Dr. Jerry E. Gould
Location: Gestamp R&D North America
1600 Harmon Rd.
Auburn Hills, MI

March Technical Meeting

Ram Solutions

2024 Ladies' Night

April 13, 2024

May Technical Meeting

TBD

CWI Seminar: May 5 - 10, 2024

Exam: May 11, 2024

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Questions? Contact: Ryan Cooper, Great Lakes Regional Sales Manager
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Chairman's Message

John Pippin

Hello AWS family and friends.

Well, January did show us that we are in the winter season, hopefully you all stayed warm and were able to deal with the snow. As we move into February, we have several events to take notice of. I did mention Ladies'

Night last month but this is such an exciting event it needs to be covered again. This is a big one hosted by Russel Webster Ladies' Night chairperson. Ladies' Night will be April 13, 2024 at The Atheneum Hotel in Detroit. Please see the link on page 2 to register.

The AWS National Scholarship Season is open. Please [Click Here](#) for more details. I would like to remind all students that the scholarship application deadline (April 1) is coming up quickly. Don't let free money slip through your fingers. In the words of our Scholarship chair – Donald F. Maatz, Jr. "Unless you are privately wealthy, you should be applying for these scholarships."

We also have a full schedule of technical meetings coming up starting, February 8th at Gestamp R&D North America, 1600 Harmon Rd, Auburn Hills. A tour will follow Dr. Gould's presentation, "Development of a Next Generation Resistance Spot Welding Cell Employing Medium Frequency – Frequency Converter Technology." This will also be our Patrons Night so please come out and thank our Patrons.

Sheet Metal Welding Conference (SMWC) will be October 22-24. The SMWC committee is looking for abstracts. Abstracts are due by March 1, 2024. Start preparing for Vendor night and if you are interested in having a booth contact Warren Peterson - wpeterson@unitedtech1.com. Watch for more information on the SMWC XX in the E-bulletin and your email. If you have questions or want to help out, please contact Andrea Orr - apeer2@ford.com.

The Detroit Section Welding Education Series is March 21-28, 5:00 to 8:00pm. This year's topic is "Laser Welding." For more information, please contact George Meeker - George.Meeker@kuka.com.

As always, you can find more information about our local events, both past and upcoming at awssection.com/detroit/. Watch the e-Bulletins and check our website often for the latest information as it is always being updated with new content. Thank you greatly for the many ways you support our AWS-Detroit Section and the industry we serve.

Thanks, **John Pippin AWS - Detroit Section Chairman 2023-24**

PS. Don't forget Valentine's Day Feb. 14! You have officially been reminded!

Our Mission is to advance the science, technology and application of welding and allied joining and cutting processes worldwide, including brazing, soldering and thermal spraying. AWS Detroit provides support for the industry in many ways, including:

- Institutional Grants (endowment based);
- Scholarships through Application (endowment based);
- Scholarships through aptitude (HSWC);
- Vocational Support (case by case but budgeted each year), Institution (e.g. supply gas and materials), Local Contest (e.g. travel expense), International Contest (e.g. travel expense);
- Student Memberships (evaluated each year);
- Student Chapter (evaluated each year);
- Technical and Educational Opportunities.

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Thank you for your support! ONE HUNDRED PERCENT of the Patron's Fund Donations are directed to scholarships for students who are pursuing careers in Welding Engineering and Welding Technology. To become a Patron, contact Steve Gucciardo, AWS Detroit Section-Patron's Committee Chair, 810-623-6508 or email gucciardos@shapecorp.com

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Ask the Welding Engineer

By Donald F. Maatz, Jr.

Q: "Do you know of a strategy one can use in an attempt to reduce resistance spot welding expulsion? We have been fighting this issue for a while, with varying degrees of success, and are looking for some fresh ideas. Our shop utilizes predominantly robot mounted welding guns, but have some fixture tools as well."

A: "In our two previous columns (ATWE Dec-23 & Jan-24) we initiated a discussion on expulsion as it pertains to the Resistance Spot Welding (RSW) process. We provided some relevant definitions, a possible path towards expulsion reduction/elimination, outlined a generic welding condition, and started a conversation about weld force as it relates to how a robust spot weld is made. We now continue, shifting the focus to the onset of current flow in a resistance spot weld.

Once we have achieved the required welding force, all that is left is to initiate current flow and make the weld.* The current

associated with a spot weld can come from varied sources, may or may not vary its polarity (think AC or DC) and where applicable, be of varying frequencies (think AC frequencies in the range of 5 to 60 Hz). But at its core, it has but one function; Heat the material by means of Joule's law: $Q = I^2Rt$. (see ATWE Dec-20).

Suffice it to say, the act of creating a proper resistance spot weld is, by its very nature, a quick and violent process. I say this as the VAST majority of RSW schedules specify less than one (1) second of current flow, programmed in either cycles, or milliseconds (ms). Of course, the rapid change occurring between the electrode caps is helped along by a current often measured in units of kilo-Amps, but I digress...

The onset of the required current begins a physical transformation of the material, and one that occurs VERY quickly – think milliseconds. But it is also important to recall, our goal was to make a resistance spot weld without *visible* drama. To do this requires many things to come together.

To start with, we need to control the current with accuracy. This is not an issue with the welding controls at our disposal. One would also like to have a robust weld schedule that limits the maximum temperature during a weld (see chart Figure 1**). After all, recall the goal is to *not* have expulsion.

From below: The red line assumes the heating loss to the water jacket and heat input almost balance. If the programmed current is too high, the very rapid rate of temperature change (heavy black line) will quickly drive one towards an unhappy place as you rapidly approach the expulsion point (shown as the blue line above the red heat curve). The situation with the red line would be a robust schedule. The area under the current line and above the minimum weld temperature represents the tolerance to variation of uncontrolled factors (think gauge or coating variation, etc.). A programmed weld

ASK THE WELDING ENGINEER
continued on page 10

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An on-line application form (with supplemental instructions) is now available on the AWS Detroit Section website, under the ‘Scholarships’ tab.
[Click Here.](#)

Application deadline for the 2024-25 academic year is April 1, 2024.*



For 2023/24 the Section was able to award 33 scholarships totaling \$64,000 to students from 7 different schools.

**Please reach out directly if you have a paper application to send in (dmatz@reautomated.com)*

**2024-2025 SCHOOL YEAR
RULES and APPLICATION INSTRUCTIONS**

Completion of this application automatically considers the student for the “Amos and Marilyn Winsand Scholarship” and the “Robert P and Mardell D Wilcox Vocational and Engineering Scholarships.” These are AWS Foundation endowed scholarships.

- 1) Applicant must be enrolled in a Welding Engineering Program, a Welding Engineering Technology Program, a Post-Secondary Technical Program (Welding Certification targeted program), or a related field of study with a strong welding content.
- 2) Students are eligible to apply for Detroit Section scholarships if they are permanent residents of the state of Michigan or the following Ontario counties: Essex, Chatham-Kent, and Sarnia-Lambton. Students who are temporary residents attending school in the state of Michigan or the following Ontario counties: Essex, Chatham-Kent, and Sarnia Lambton are eligible for non-named scholarships. Preference will be given to students who are permanent residents of the Detroit Section territory, including Ontario counties: Essex, Chatham-Kent, and Sarnia-Lambton.
- 3) The Detroit Section Scholarship Committee administers the AWS Detroit Section Scholarship program, with the assistance of the AWS Foundation. The Committee also selects the recipient of the Amos and Marilyn Winsand Foundation Endowed scholarship as part of this scholarship application.
- 4) AWS Detroit Section Scholarships are paid in varying amounts based on individual awards. If an applicant is awarded a scholarship, the payments are made directly to their qualifying educational institution. Payments are made through the AWS Foundation.

Application Instructions

The information requested on the application form is self-explanatory. Please fill out the form completely.

The AWS Foundation inter-active application is available either at awssection.com/detroit under the Scholarships tab or by going directly to the AWS Foundation scholarship page: scholarship.aws.org/

For additional information about the scholarship program, please see aws.org/foundation/page/scholarships

AWS membership is encouraged of all welding aspirants.

In addition to the application form, you must enclose or attach the following:

- **Transcript(s)**
Official scholastic records or grade transcripts from the high school, college or university you attended during the recent school year.
- **Personal Statement and Work Experience**
Ambitions, goals, background, and other factors that will help the selection committee understand your commitment to pursuing a welding career.

February Hotline

Happy Birthday Mr. Amos Winsand!

One of our most esteemed AWS Detroit members, Mr. Amos Winsand celebrated his 100th BIRTHDAY in OCT. AND HE CELEBRATED HIS 100TH CHRISTMAS with family in December. It is rumored that Amos drinks wine EVERY day and that is what helps him stay so spry. Amos, we wish you an awesome year in 2024 and hope to hear of your 101st birthday this fall. God bless you and keep you well!!!

Don DeCorte Retires!

After 29 years working with RoMan Mfg., AWS Detroit Section member Don DeCorte has finally retired from RoMan. So he doesn't drive his wife Patty crazy, Don has started a new company: DTS Technical Services. Don is offering resistance welding equipment and process training. This is Don's 43rd year as an AWS Detroit Section member. Don's RoMan Mfg. email will no longer be answered by Don so you can contact him at: ddecorte861@gmail.com or 1-616-299-4406.

Sheet Metal Welding Conference XX

The twentieth Sheet Metal Welding Conference will be October 22 – 24, 2024 at Laurel Manor. Abstracts are due March 1, 2024. The directors of this year's event is hoping for a large word-of-mouth turnout and is politely asking for your help to spread the word. Companies seeking to participate in the 'public-welcome'

Vendor Night or become SMWC sponsors, are encouraged to contact Andrea Orr for more details.

Upcoming New Member Welcome Webinar

If you are new to AWS, join the upcoming New Member Welcome Webinar on **Tuesday, February 13th at 2 PM**. This online event hosted by AWS staff will provide an overview of AWS, Individual Membership benefits, share how to navigate the AWS Member Network, and discuss how to become more involved within the Society, including at the local community and Committee levels. For those joining live, you will get an opportunity to get your questions answered during our Q&A portion of the webinar. Get registered today! [Click Here](#)

https://aws-org.zoom.us/join/290565776&hsenc=p2ANqtz-UXxS9yU64vmFdjlspx-lmI1hvm0d524Rc2ecBHPYsg8C2gO9gijifjM6fCkATR7FVCCJHYnN0-wd08h5FFzY3tskXng&utm_content=290565776&utm_source=hs_email#/registration

AWS Detroit now recognizes Mark Rotary as National District 11 Director

Former National District 11 Director Phil Temple was acknowledged by National District 11 Director Mark Rotary for successfully providing all the information necessary for the transition into the new position. It is with a heavy heart that AWS Detroit has watched the transition unfold, and it is with cheer and admiration we see Mark step up to take Phil's place. Many thanks and praise to you both.

continued on page 8

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Ever wanted to become a Certified Welding Inspector but found the cost of the week-long seminar prohibitive? Now you have the opportunity to submit an application to be considered for the free seminar seat offered by the AWS-Detroit Section. If you are interested, please submit an application with [this Wufoo form](#) by February 25, 2024 for the CWI seminar being held from May 5th to 10th. (Part B Exam on May 11, 2024) at the Detroit Metro Airport Marriott (30559 Flynn Dr., Romulus, MI 48174). If you have any questions, email elalinsky@ipgphotonics.com

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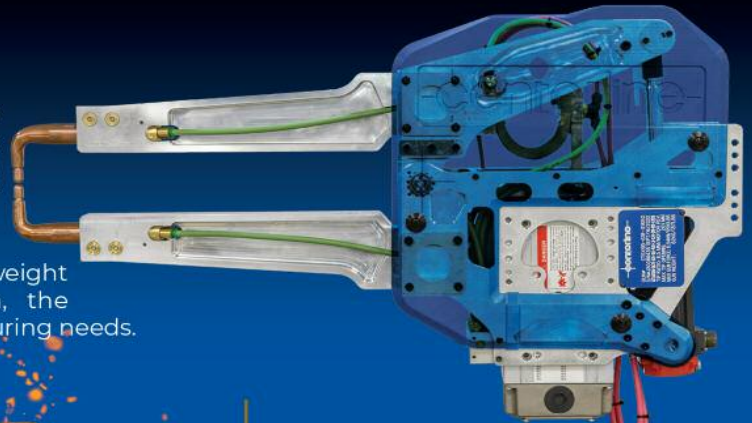
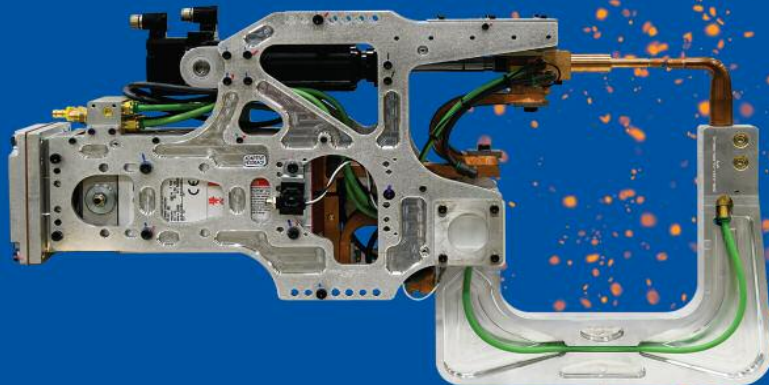
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Anthony Lizzio
Hartland, MI
Ferris State University
Welding Engineering Technology
Detroit Section Scholarship
District 11 - 101-Central Michigan

Dear Donors to the Detroit Section Scholarship,
I would like to extend my sincere and grateful thanks in acceptance of your very generous scholarship. As a young professional and student working my way through college, these scholarships offered by generous donors such as yourselves are greatly appreciated. These funds will go directly to paying off my tuition total, bringing me closer to the goal of graduating the Welding Engineering Technology program here at Ferris State University with little to no debt. Once again, thank you so much for your help and generosity.

Sincerely,
Anthony T Lizzio

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Brendan LeTissier
Rochester Hills, MI
Ferris State University
Welding Engineering Technology
Detroit Section Scholarship
District 11 - 011-Detroit

I would like to say thank you for selecting me for this scholarship and for the opportunity to continue to pursue my welding education. I hope to put it to good use in my upcoming classes at Ferris State University. Your help gives me even more motivation, knowing I have the support of AWS Detroit to continue to pursue my goals in welding engineering. This, again, has been a great honor to have been chosen, and I am incredibly thankful for your generosity.

Thank you,
Brendan LeTissier

ASK THE WELDING ENGINEER *cont'd from pg 5*

current that is too low (purple line) may result in an insufficient temperature increase, and fusion is not achieved.

So, if everything has been done correctly, we will end up with an acceptable resistance spot weld. Success in this case is defined as a weld having dimensions greater than the minimum required, with good morphology, providing sufficient strength for the application, in the desired location, with acceptable surface characteristics, and no visible drama (aka no expulsion).

To expound a bit more on this idea, sometimes a picture can be helpful – In this case a metallographic image from a 1.2-1.8 mm RSW (Figure 2). However, a picture is just a snap shot. What we really need is a video to show how quickly things change. And for that, we will need some help from the internet.

Search for words to the effect of *resistance spot welding cross section video*. Of course, dependent on the algorithm of the day and where you search, you should hopefully find something resembling an image of a set of electrodes sectioned in half, welding on the edge of two (2) or three (3) sheets of steel.

The first thing to know is the action depicted in the video is now very much in slow motion. Also, the majority of these videos were filmed utilizing AC welding on some sort of steel. This means it is now possible to see each $\frac{1}{2}$ cycle of heating (AC @ 60 Hz). While there is much to discern from a video such as this, we will focus on just the timing of the event. Specifically, just how quickly heat is generated.

At some point in the video, you will see molten metal appear, and then grow in a pulsing manner with each $\frac{1}{2}$ cycle. When viewed a few times, one can get the timing of the pulsations in your head. I

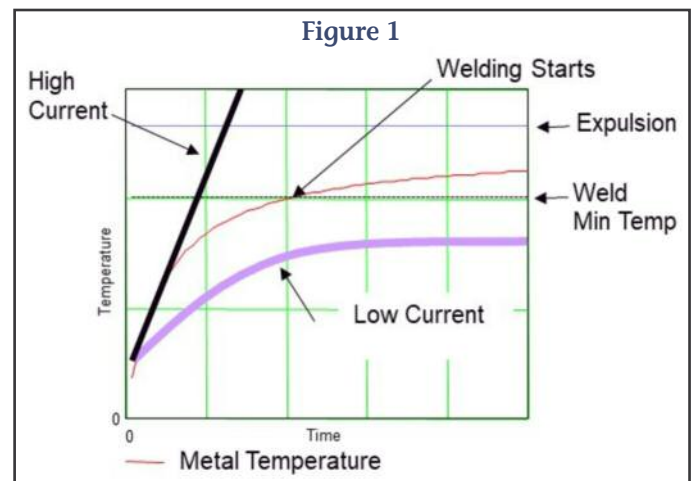


Figure 2



would suggest you then go back and watch the video from the beginning again, noting when you see the first signs of heating – Perhaps a puff of smoke, etc.

When viewed from the beginning, you can count each $\frac{1}{2}$ cycle of current being applied. And more importantly,

ASK THE WELDING ENGINEER continued on page 12

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Travis Lindquist
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Dear AWS Detroit Section,
Words cannot express what an honor and relief it is to be selected for the Detroit Section Scholarship! As a first generation college student, I am beyond grateful to receive such an award.

As you know, I have been working as a fabricator for almost ten years now; and I am eager to pursue a higher education in the field of Welding Engineering. Since the start of 2023, I have been enrolled at Monroe County Community College where I earned a 4.0 GPA in the four classes I took during the winter and summer semesters. Thanks to those efforts and a bit of luck; this fall I am headed to Ferris State University as a junior transfer student. I will be getting involved with the AWS recognized student organization on campus. I am looking forward to making the most of this journey. At 28 years old, the decision to go back to school full time was not made lightly and I fully intend to get the most out of this education.

The receipt of this scholarship not only lifts the financial burden of tuition, but motivates me to succeed in my selected field of study knowing that you read my story and chose me for this award. I hope that my future success grants me the opportunity to give back to future generations interested in welding not only in the form of scholarship donation, but as an educator.

Sincerely,
Travis Lindquist

ASK THE WELDING ENGINEER *cont'd from pg 10*

what is happening. Perhaps there is initially some smoke, then (if coated) zinc being melted and expelled into the air. The metal now starts to turn color, with the heated section taking on the rough shape of an hourglass. Finally, the material starts to melt, and the churning molten pool grows until the passage of current stops. The question is how much time elapsed, or in other words, how many pulses did you count from the initiation of current flow until you saw the first signs of melting?

My guess is not many. Each $\frac{1}{2}$ cycle of 60 Hz AC is only 8.3 ms. So, if you counted 12 pulses before you witnessed melting, it only took 100 ms (about a 10th of a second) to heat the steel from room temperature to the melting point of iron (Fe) at 1538 °C. In a word, wow!

But now that we have a feel about how to make a spot weld without expulsion, it might be a good idea to explain what circumstances must occur to create it. And that will be the point where we continue this discussion in our next column."

** As with many things related to any resistance welding process, the application of secondary welding current is a very robust but involved process, and not for one second to be taken for granted. The subject in general, and the components required to make it happen in particular, are worthy of several ATWE columns (see ATWE Feb-16 for a single example).*

***Figure 1 is courtesy of my first manager in the welding industry when I hired into Ford, Jim Dolfi. Jim shared this with me years ago as a part of our many conversations over the years concerning welding. Thank you and RIP my friend.*

References:

Figure 2 – Courtesy of R&E Automated

If you have more questions about this topic, contact Don Maatz at:

R&E Automated Systems
70701 Powell Road, Bruce Township, MI 48065
Office: (586) 228-1900; Direct: (734) 793-2304
dmaat@reautomated.com

Donald F. Maatz, Jr. is with R&E Automated Systems and serves in the capacity of Laboratory Manager. He is past-chairman of the AWS-Detroit Section, serves on the D8 and D8.9 Automotive Welding Committees, is chair of the D8D, and an advisor to the C1 Resistance Welding Committee, is an AWS endorsed CWI and an instructor for the RWMA School. He is a graduate of Ohio State with a BS in Welding Engineering.

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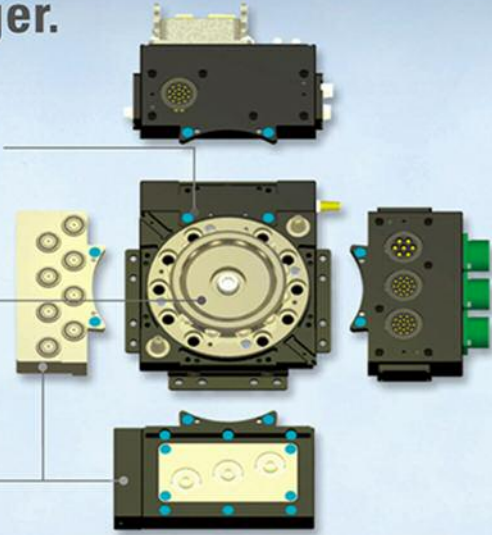
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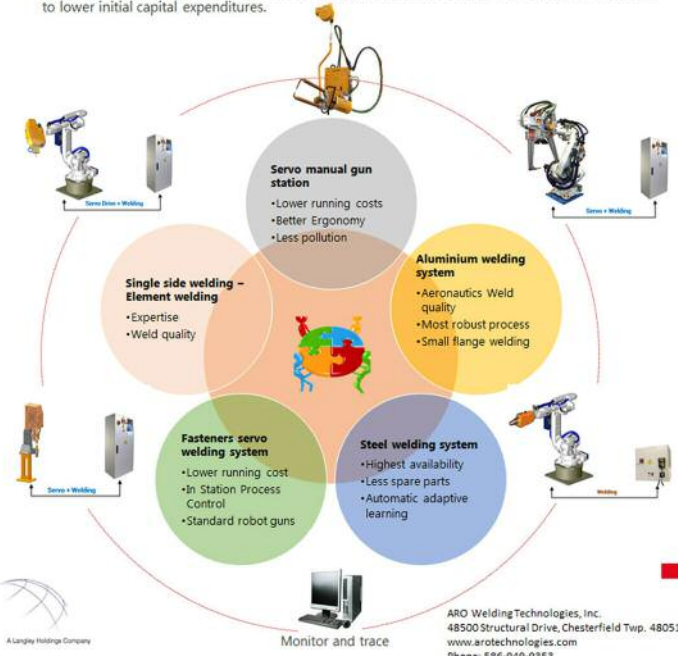


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ANNOUNCEMENT FOR ALL SCHOOLS

Two Separate Grant Opportunities for Your School!

#1 DUE DATE: March 15, 2024

AWS Foundation Welder Workforce Grant – National

The AWS Foundation is committed to securing the future of the welding industry by positively impacting welding education.

The Welder Workforce Grant is the latest effort to ensure a skilled workforce is ready when industry calls.

This year, the AWS Foundation will award up to \$300,000 to improve and expand training programs and institutions to increase the number of welding graduates across the country. Please note that starting in 2019 Applicants must be both an AWS Educational Institution Member and SENSE Registered to apply for the Welder Workforce Grant.

You must visit this website and follow the instructions for applying:
aws.org/Career-Resources/Students/Grants/



#2 DUE DATE: March 15, 2024

Detroit Section Welder Workforce Grant

Eligible School Geographic Locations

The AWS Detroit Section Welder Workforce Grant eligible schools reside in our Section boundaries which include the Lapeer, Macomb, Oakland, St. Clair, and Wayne counties in the state of Michigan; and Essex, Chatham-Kent, and Sarnia-Lambton counties in the province of Ontario. Schools are also eligible if they reside in Livingston, Monroe or Washtenaw counties in the State of Michigan.

The AWS Detroit Section Welder Workforce Grant is a \$15,000 grant open to any training program or institution within the boundaries of the Detroit Section. Applicants for the Detroit Section Welder Workforce Grant do not need to meet the requirements of being SENSE Registered and an Education Institution Member. The AWS Detroit Section in it's commitment to local schools and educators established this endowed grant in partnership with the AWS Foundation. The grant is awarded in parallel to the AWS Foundation national funds.

Schools in the Detroit Section boundaries are eligible for these monies as well as the monies from the Foundation.

It is recommended that schools applying contact the AWS Detroit Section Grant committee and request a letter of recommendation.

The contact is Wesley Doneth – 810-844-2800 or doneth.wesley@fronius.com. The grant was made possible thru the AWS Detroit Section due to our members and the commitment of supporting companies.

You must visit this website to see the requirements and instructions for applying:
aws.org/Career-Resources/Students/Grants/Section-Grants/

Grants up to \$25,000 are available for secondary and post-secondary education/training institutions to enhance and improve welding programs resulting in an increase in the number of welding graduates and/or the number of graduates successfully placed in welding or welding-related jobs. Please see the rules online when applying but typically:

FUNDS MAY BE USED FOR: Welding or metalworking equipment purchases or upgrades; facility improvements; capital items; computers, computer-based training systems.

FUNDS CANNOT BE USED FOR: Any program or area not related to welding education/training; travel expenses; personnel or to expand teaching staff; student tuition or scholarships; textbooks or teaching materials; classroom or lab materials and/or supplies; personal protective equipment; indirect costs. *No grants will be given to individuals.*

**American
Welding Society
– Detroit Section**

**Seminar
Information**

Dates

CWI Seminar
-> May 5 – May 10, 2024

Exam -> May 11, 2024

Location

Detroit Metro Airport Marriott
30559 Flynn Dr
Romulus, MI 48174

AWS CWI Seminar Seat

Opportunity for a free seat in the
AWS CWI Detroit Seminar



Ever wanted to become a Certified Welding Inspector but found the cost of the week-long seminar prohibitive? Now you have the opportunity to submit an application to be considered for the free seminar seat offered by the AWS-Detroit Section.

If you are interested, please submit an application with [this Wufoo form](#) by February 25, 2024.

If you have any questions, please email elalinsky@ipgphotonics.com

