American Welding Society®
DETROIT SECTION

e-Bulletin

MAY 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.

Affiliated With
ESD
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Thursday, May 16th - 5:30pm to 8:00pm

AWS Detroit Section:

Technical Meeting and Awards Night

Agenda

5:30pm - 6:00pm: Networking

6:00pm - 6:15pm: Awards Ceremony

6:15pm - 7:00pm: Dinner and Presentation on Handheld Laser Welding and Cobots

7:00pm - 8:00pm: Live Demos with LightWELDs and LightBOTS

IPG Photonics
46695 Magellan Dr,
Novi, MI 48377

RSVP by May 10th, 2024

Call Juanita at (248) 295-9631 OR email jgarland@ipgphotonics.com

PLEASE SCAN THE QR CODE TO BEGIN PRE-REGISTRATION

Or Visit: mylobbysignin.netlify.app/?siteid=1675406228260

For US Citizens, it is okay to take a legible photo of your Driver's License. Unfortunately, the process may be confusing. If anyone has trouble with the pre-registration, please email or call Juanita Garland <**jgarland@ipgphotonics.com**> or Erin Lalinski <**elalinsky@ipgphotonics.com**>. You also have the option to arrive a few minutes early to pre-register on site and someone will be there to help with this process.

American Welding Society DETROIT SECTION X IPG PHOTONICS X FANUC

eBulletin Contributors

(Emails linked where available.)

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TECH NIGHT MEETING RESERVATIONS
Warren Peterson

Chairman's Message
John Pippin

Well, I am not sure how this has happened again, but they voted me out of the island. Just kidding, however yes, my time as the Detroit Section Chairman is almost complete. I am very happy to say this time we actually had meetings and events in person. This was a lot more fun in person vs the virtual year we had the last time I was Chairman.

I would like to take this opportunity to thank the Detroit Section for allowing me this repeat performance, however, this time in person. As my Chairmanship comes to an end, I would like to thank the AWS Detroit Section committee members for a very positive experience. I would also like to welcome **Russell Webster** into the Chairman position and wish him the best. As well, I would like to thank Russ and **Don Maatz** for their support throughout the year. As I make my exit, so is our District Manager **Phil Temple** and what a job he has done for our District! Thanks for your support Phil, and I hope you and Joyce have plenty of fun now that you have nothing to do! Just kidding...enjoy my friend! And now to Mark Rotary: you are on the clock as our District Manager. I am positive you will fill this role as well as Phil did. Lastly, it would not be right if I did not mention **Forrest Lissner,** our e-Bulletin editor, on a job well done.We are going to miss you next year. He did a great job chasing me down to get this message out to everyone each month.

If you did not make it to the 2024 Ladies' Night, you missed a great time and I would like to say job well done to Russell Webster and his Committee. I've even heard that this party had revenue in excess of expenses. This will make Don Maatz and his Committee for Scholarships happy. Again, great job to everyone involved! I know I personally had a wonderful time.

You don't want to miss the May Tech Night at IPG. **Ryan Shevlin** from Serra Laser and **Mike Sharpe** from Fanuc will be speaking about handheld laser welding and how that can be used with cobots. Doors open at 5:30, May 16th for networking and the AWS Awards Ceremony will begin at 6:00 followed by dinner and the presentation. Please see the e-Bulletin for additional information and please make sure to RSVP by May 10th to save your spot.

This is what we have planned for the balance of the year:

- **Get your golf game ready.** The AWS Detroit Section will host our annual golf outing in July at Cherry Creek Golf Course, Charter Township, MI. Watch your e-Bulletin for more information.
- **Be sure to check out our Hotline articles.** If you have an item you would like to see published, reach out to our Hotline Editor, Cody Nichols. As a reminder, the "Hotline" section is devoted to topics that are general interest items for members of the Detroit Section.

Thanks, and stay safe and healthy,

John Pippin
AWS Detroit Section Chairman
2023-24

May 16th Awards Night Ceremony

Our May Technical Meeting will include our annual awards ceremony. We will be honoring seven of our members for all the hard work they do for AWS and what they do to promote welding.

Awards Chairman Michael Karagoulis will present this year's honorees:

ELIZABETH LEKARCZYK	*Section Appreciation*
KEVIN TENG	*Section Appreciation*
MARK SALGAT	*Section Appreciation*
FORREST LISSNER	*Section Meritorious Award*
WES DONETH	*Section Distinguished Service Award*
JOHN MCKENZIE	*Section Distinguished Service Award*
PHILLIP TEMPLE	*Section Distinguished Service Award*

There are a number of our members who have District or National Awards pending. Stay tuned for updates this Fall!

Thank You, and Congratulations to this Year's Fine Honorees!

Upcoming Events

May Technical Meeting

May 16, 2024

IPG Photonics

Annual Golf Outing

July

Cherry Creek Golf Course
Charter Township, MI

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.*

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 previous columns regarding expulsion (ATWE Dec-23 thru Apr-24) we discussed the phenomenon as it pertains to the Resistance Spot Welding (RSW) process. These earlier columns have taken us in many directions as we looked at various aspects of what can cause expulsion. But now I think it is time to actually take a moment and attempt to measure it.

One of my favorite quotes is a colloquial expression used to try and categorize something that is not clearly defined. I first heard it in relation to a Supreme Court case* and have never forgotten it. The quote: I know it when I see it. I think this describes how we as an industry view expulsion quite well.

No one can doubt the event where molten glowing material bounces off the ceiling and back to the floor is expulsion. But what about when one is welding aluminum? Its expulsion is almost invisible, that is until it paints your clothes. Or what should we do if what we think what might be expulsion only appears to travel a few feet? Wasn't that just surface contamination and/or coating being burnt away, or perhaps some sealer or adhesive making an untimely exit? As I alluded to earlier, we know it when we see it. Or is there room for improvement in this regard?

My earliest encounters with the RSW process were with equipment utilizing braided rope shunts in push-pull applications. Did I mention there were also very large AC weld control cabinets equipped with ignitron tubes (with their subtle blue glow) running schedules that only permitted for the phase-shift control of current? Needless to say, in almost every aspect, the RSW process has come a long way. And one of the most intriguing and exciting is how we are now able to monitor the weld as it is being made.

As one might imagine, the concept of determining the magnitude of expulsion early in my career was strictly based on visual feedback. But with a whole host of various advances, we can now 'look' inside of a weld while it is being made and it has been a whole new learning experience.

While the type of measurements needed were possible for many years in a mostly laboratory environment (think strip-charts in the 50's), it took a while for things to migrate to the floor. These days we have adaptive MFDC weld controls with Windows based network interfaces that are capable of displaying and recording reams of data. It is at this point where I will take a slight pause and say I am not for one minute going to say I am an expert on how any of these controls work, or what their ever-increasing capabilities are. There are many great folks working at these companies and they should be your first phone call. I am just going to convey a bit of what I have learned over the years and where I apply it.

One great aspect of these controls is their ability to measure and graphically display the results of what is electrically occurring with the weld. In some instances, they can display the results for several welds at the same time. It is in this situation where the humans typically come into the picture. I say this as once in a while our innate ability for pattern recognition comes in handy. But I digress…

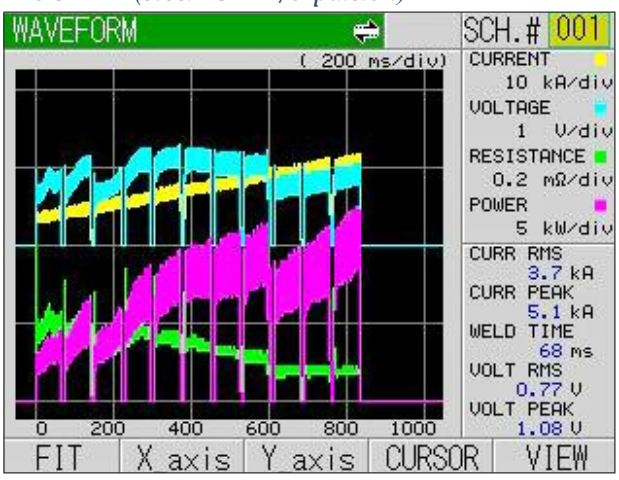
For this discussion, we will start with a single weld and work our way up. The two (2) screen captures (Figure-1 & 2 below) will help to illustrate the point. Both of these images are the end-product of a rather sophisticated secondary meter, and each depicts just a single weld. From a welding perspective, both Figure-1 and Figure-2 were made under identical conditions with one notable exception. The programmed current values are different. If it is not clear, there are actually four (4) variables being captured in each graph: current, voltage, resistance & power.

At first glance, all appears to be normal. The current slopes (yellow) are predictably constant (both welds are programed with a slope-current increasing pulsation schedule). It was when these welds were actually made that one notices the difference – the second weld (Figure-2) had visible expulsion. But what is the data telling us. For one, we see that the control did a nice job of following the programmed current path. The yellow line starts at a lower value and builds in a consistent fashion. The other lines (voltage, resistance & power) are where one sees things start to look a little odd. Specifically, each one exhibits a rather sudden dislocation event, in this case there are

ASK THE WELDING ENGINEER
continued on page 7

FIGURE-1 *(steel RSW w/o expulsion)*

FIGURE-2 *(steel RSW w/expulsion)*



two (2) of them. One guess as to when the onset of expulsion occurred.

When we look at the data available from the weld control (Figure-3), we now see the potential magnitude of being able to measure what is happening over the course of many welds. As before, we need to look for something that is different. In other words, your time spent watching Sesame Street** when you were younger is about to pay dividends.

For Figure-3, the current is increased for a series of welds (the lower set of lines). At each higher current level, the measured resistance is fairly consistent. That is until we see the step-down drop occur in the yellow resistance line (256495). Again, one guess as to when the onset of expulsion occurred. For context, all of the aforementioned welds are for RSW on steel. Aluminum typically exhibits a similar behavior. But in some cases, the changes can be more subtle (see Figure-4 below) where the sharp resistance curves are welds without expulsion (256722, 256723, 256724), and the ones that have a rounded peak (256725, 256726, 256727) exhibited expulsion post-peel.

FIGURE-3 *(Multiple RSW on steel)*

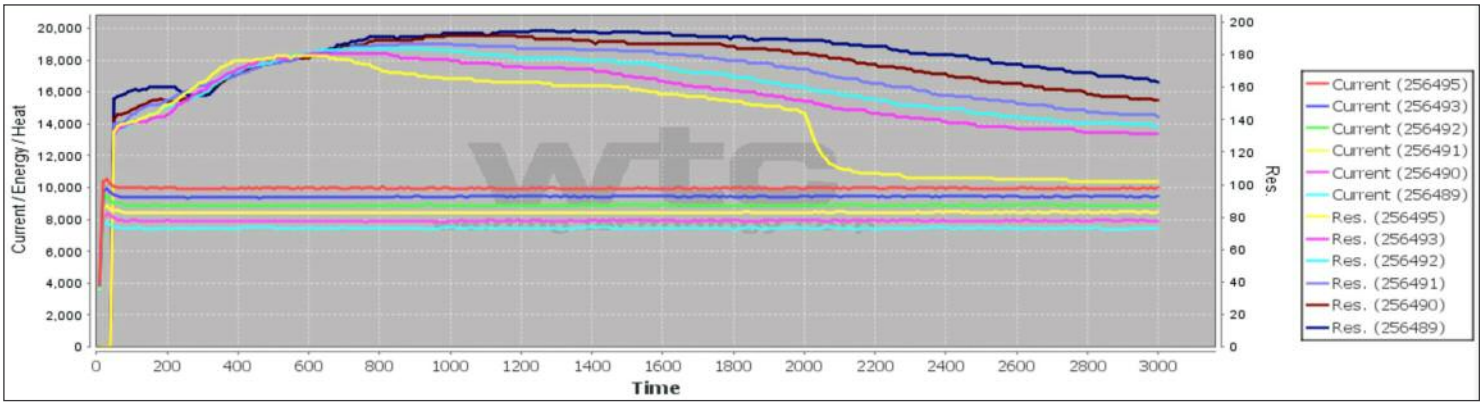
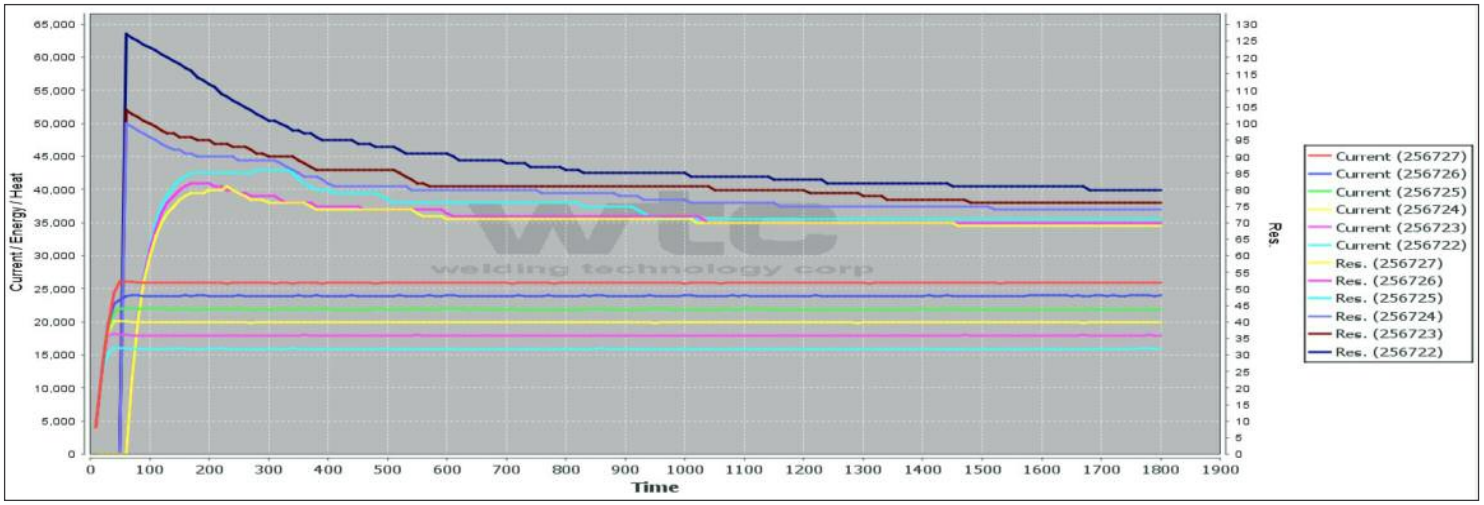


FIGURE-4 *(Multiple RSW on aluminum)*



As we have detailed above, there are many ways to determine when a weld has experienced an expulsion event, and when it most likely has not. Some are based on our own senses, but others require a level of sophistication that has only been readily available in the past decade or so. My hope is that we continue to grow our knowledge in this area and add a degree of robustness to the RSW process it has never seen before.

For our next column, we will put a bow on our discussion regarding expulsion."

**Jacobellis v. Ohio (https://en.wikipedia.org/wiki/Jacobellis_v._Ohio)*
***https://en.wikipedia.org/wiki/One_of_These_Things_(Is_Not_Like_the_Others)*

If you have more questions about this topic, contact:
DON MAATZ
R&E Automated Systems
70701 Powell Road, Bruce Township, MI 48065
Office: (586) 228-1900; Direct: (734) 793-2304
dmaatz@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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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**

May Hotline

The AWS Foundation proudly awards over 1,500 scholarships annually, ranging from $1,000 to $6,000 to students at technical schools, two-year colleges, and four-year universities.

Ferris State University Faculty Positions Available. CLICK HERE.

Ladies' Night 2024

(L to R) Mike Karagoulis, John McKenzie, Phillip Temple and Mark Rotary

The AWS Detroit Section hosted it's annual Ladies' Night fundraiser for section scholarships at the Atheneum Hotel in Detroit, Michigan, April 13th.

Distinguished Service Awards were presented to Phillip Temple and John McKenzie for their dedication to the AWS Detroit Section.

(L to R) Don Maatz, Russell Webster and John Pippin

(L to R) Mr. & Mrs. John Pippin, Mr. & Mrs. Russell Webster and Mr. & Mrs. John McKenzie

(L to R) John McKenzie, Mike Karagoulis and Mark Rotary

(L to R) Mike Karagoulis, Phillip Temple and Mark Rotary

Reflecting On Days Gone By...

Tech Night 1989!

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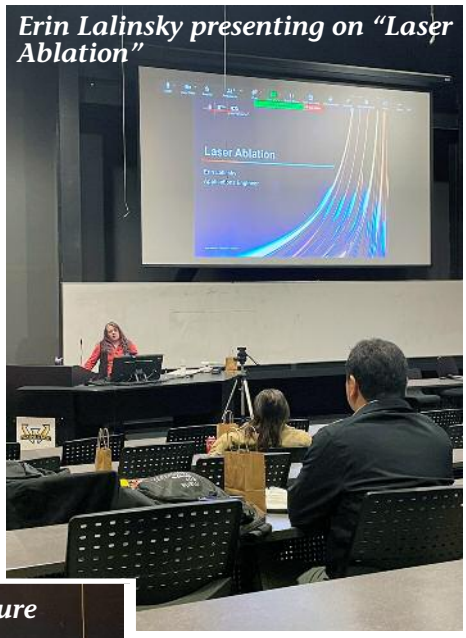
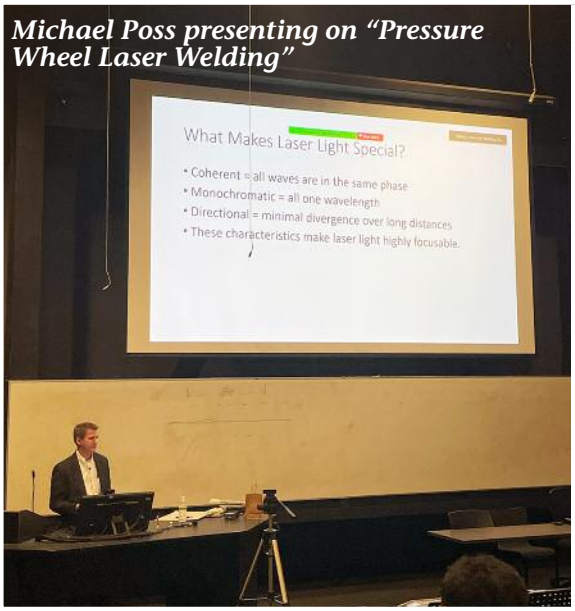
AWS Detroit Section Educational Series

The AWS Detroit Section hosted a two-day educational series at Wayne State University on March 21st. Students, instructors, and industry professionals watched and learned about different laser applications in the automotive industry. Multiple different aspects were shown from design of parts to conform to the requirements of laser operations to the maintenance and upkeep required of a laser system once installed from a welding engineering perspective.



Erin Lalinsky presenting on "Laser Ablation"



Michael Poss presenting on "Pressure Wheel Laser Welding"

PRESENTERS:

Travis Stempky - Trumpf
"Fundamentals of Laser Welding"

Jon Delboy - Kuka Systems North America
"Laser Welding of Aluminum/ Dual Core Benefits"

Scott Heckert - Coherent
"Remote Laser Welding"

Arkan Abdulkadir - Fraunhofer
"Lasers for Additive Manufacturing"

Patrick Rota - SDK Engineering
"Roof Laser Brazing"

Junie Ma - General Motors
"Battery Welding with Lasers"

Michael Poss - General Motors
"Pressure Wheel Laser Welding"

Erin Lalinsky - IPG Photonics
"Laser Cleaning/Ablation"

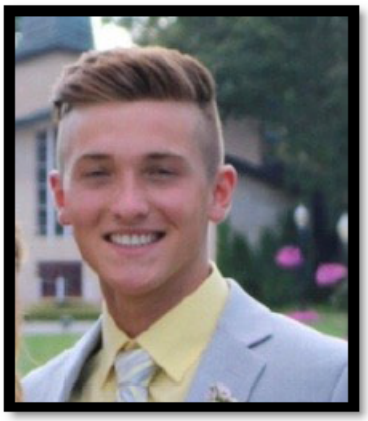
The audience learning from presenters on the second day of the event

Patrick Rota presenting on "Roof Laser Brazing"

Junie Ma presenting on "Laser Welding in Battery Cell Manufacturing"

Madison Wutke
New Hudson, MI
Wayne State University
Welding and Metallurgical Engineering Technology
Detroit Section Scholarship
District 11 - 011-Detroit

Dear Detroit Section,
Thank you for awarding me the Detroit Section Scholarship. It means a lot to be chosen to receive this scholarship by the American Welding Society. Over the past year, I have been involved in setting up the AWS Student Chapter at Wayne State University. Once I finish my degree, I would like to work towards getting my CWI and becoming more active in AWS.
Thank you, Detroit Section, for your generosity.
Madison Wutke



Zackary Wright
Adrian, MI
Ferris State University
Welding Engineering
Detroit Section Scholarship
District 11 - 101-Central Michigan

To whom it may concern,
I am honored to have been chosen as the recipient of your AWS scholarship. I want to thank you for choosing to support my education and help me achieve my goals. Scholarships are a huge part of what motivates me to stay on top of schoolwork and learn to the best of my abilities. Knowing that others have enough confidence in me to give me support, helps me to feel more confident in myself and drives me to provide myself the best future possible. I appreciate the scholarship so much and it will help me a lot going into my senior year of college. I am currently working on completing my internship and have high hopes for what the future of my welding career may hold.
Once again, thank you very much for your generosity and selecting me as the scholarship recipient. If there is anything else you would like from me, please do not hesitate to reach out. I will include my contact information below.
Best Regards,
Zackary Wright
(517)215-1003
zackwrightt@gmail.com

Lance Wheeler
Caledonia, MI
Ferris State University
Welding Engineering Technology
Detroit Section Scholarship
District 11 - 051-West Michigan

Dear Detroit Section,
I am writing to express my gratitude to you for the Detroit Section Scholarship of $2,000.00. I was thrilled to learn of my selection for this honor and I am deeply appreciative of your support.
I enrolled in the AAS Welding Engineering Technology program at Ferris State University and have completed my associate degree. I am now in the BS Welding Engineering Technology program at Ferris State University and plan to complete it in 2024. I am currently working as an intern at Hobart Filler Metals for the summer in Troy, Ohio.
By awarding me the Detroit Section Scholarship you have lightened my financial burden which allows me to focus more on the most important aspect of school, learning. Your generosity has inspired me to help others and give back to the community. I hope one day I will be able to help students achieve their goals just as you have helped me.
Sincerely,
Lance Wheeler
269-251-7734
lancejettwheeler@gmail.com