April Technical Meeting - Education Night
Thursday, April 19, 2018
Tool & Die Repair: Consumables and Automation
Ukrainian Cultural Center
26601 Ryan Rd., Warren MI 48091
Map/Directions

After TAX DAY ‘18 and the event of the year; LADIES NIGHT, please come out to learn and earn (PDHs) from one of Detroit’s very own tool and die application-specialists companies. This promises to be a very informative session designed to bring awareness to a niche market – often encompassing our typical everyday tooling and processing equipment. Discussion on unique consumable types and formulations, general tool & die repair procedures, and finally the full-circle implementation of robotic automation of the aforementioned will be presented.

After this presentation, it is very possible that you will never look or think about your tooling and the repair thereof the same way again. Please bring your questions to challenge the night’s forum. Presenter Bios begin on page 2.
Well Spring is here and there is plenty going on at the AWS Detroit Section.

April is designated as National Welding Month by the American Welding Society, I encourage you to go to a great website where there is information about our industry and all the variety it offers. [www.careersinwelding.com/](http://www.careersinwelding.com/) Please share this with a young person who may be in search of a career for their future as there is a wealth of information there that could spark their interest.

The AWS National Website is also a great resource [www.aws.org](http://www.aws.org) along with the Detroit Section Website [www.awsdetroit.org](http://www.awsdetroit.org)

Consider bringing a student to our education series event scheduled in April. More information about the details are listed in this bulletin.

Our oldest and most time honored social event is scheduled for Saturday April 14, 2018 our 78th Annual Ladies Night Gala. Mark has a great event planned and it will be a wonderful evening and opportunity to network. If you have any questions please visit our website awsdetroit.org for more information – you can even purchase tickets online.

I wish you a wonderful April and hope you get a chance to enjoy the sunshine and warmer days. Brighten someone’s day and forward this bulletin on.

Best regards

Wesley Doneth

AWS Detroit Section Chairman – 2017-18
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[www.awsdetroit.org](http://www.awsdetroit.org)

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**Presenter Bios continued from page 1**


Robert Addington started in the Tool & Die Welding industry in March of 1967 at Eureka Welding Alloys Inc. With 51 years of experience and knowledge has made Mr. Addington an expert in this field. Currently heads up Eureka’s South Korean market.

Chris Kerchkof started at Eureka in April of 1997 as a machine operator running production in shop area. Attended Macomb Community College where he studied metallurgy and welding. Became a Sales Representative in 2005 and moved on to become Sales Manager in 2014. Currently heads up Robotics Division.
Editor’s Notes

Where is this year going? I can’t believe it’s April and we are almost celebrating our annual Ladies Night event again. This year may actually be a sold-out event! Which is perfect, because not only does it allow us to celebrate our spouses/significant others that support our welding careers, but it provides funding for our Welding Scholarships and allow us to continue to provide for a future in welding.

This month we also highlight education at the Educational/Tech Night on April 19th. Eureka Welding Alloys will be sponsoring the night and covering several topics including tool and die repair. Hope to see you at the Ukrainian Cultural Center for education night.

You may see some changes in the bulletin over the next few months. Both columnists, Don Maatz, Jr. who provides our Ask the Weld Engineer Columns, and Eric Lichtfusz, who provides the CWI columns have been doing an excellent job at sharing information with all of us and presenting it well. With that said, there may be months where we alternate the columns and give them each a break.

Thank you for your readership, and until next month…

Keep on Welding!

Robin
Career Opportunities

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Job Responsibilities:

- Hands-on responsibility for weld engineering projects such as production process development, weld equipment maintenance needs, instructions, and weld station methods.
- Review and analyze production, quality assurance, maintenance and other operational reports to identify non-conformities in product weld quality and output and resolve production problems.
- Perform weld capability analysis. Troubleshoot and correct weld instability and welding equipment capability.
- Participate in initial engineering control plan and procedures to assure product process capability to achieve quality products.
- Responsible for writing weld process instructions.
- Hands-on responsibility for troubleshooting and repair of production welding equipment in support of the maintenance department.
- Maintain process documentation describing control of manufacturing process (FMEA, control plan, operator check sheets, operator and gauge work instructions, process sheets, deviation postings, Poka-Yoke check sheets, PM check sheets, tool matrix postings).
- Maintain action plan for continuous improvement for weld department, coordinate efforts for plant goals and objectives with Area Manager.
- Remain current with the latest technology developments, and benchmarking and testing of new technology.

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Windsor, Canada, March 8, 2018

CenterLine (Windsor) Limited is pleased to announce that it has maintained its status as a Gold Standard Requalified winner and has been recognized for overall business performance and sustained growth with the prestigious Canada’s Best Managed Companies award.

Now in its 25th year, Canada’s Best Managed Companies is one of the country’s leading business awards programs recognizing Canadian-owned and managed companies for innovative, world-class business practices. Every year, hundreds of entrepreneurial companies compete for this designation in a rigorous and independent process that evaluates the calibre of their management abilities and practices.

This prestigious national award is sponsored by Deloitte, CIBC, Canadian Business, Smith School of Business, TMX Group and MacKay CEO Forums.

“Being amongst the best in class requires more than financial performance,” said Lorrie King, Partner, Deloitte and Co-Leader. “Achieving sustained growth and strong overall business performance is the result of the combined efforts and commitment of the entire organization.”

CenterLine congratulates its outstanding staff for its unwavering dedication to excellence and thanks its many valued customers and suppliers for their contributions in helping us realize this tremendous achievement.

Contact: Marc Levesque – Director, Corporate Marketing
Phone: (519)734-8464 ext. 4459; email: marc.levesque@cntrline.com

Information Coming Soon

Save the Date!!!

2018 AWS Detroit Section Golf Outing

Thursday
July 19th 2018

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Whether you’re a business owner in the welding industry, a quality manager, a welder, or anywhere in between, you may have heard of a WPS. Knowing what one is and understanding its purpose and origin may be another story. If you have no clue what a WPS is, fear not, because I’m going to share with you, not only what a WPS is, but why they’re important. If you already know what a WPS is, read on anyway, if for no other reason than for the entertainment value.

The letters WPS are an acronym for Welding Procedure Specification, and rather than giving you a technical definition for that group of words, I’ll try to explain it the way I’ve seen it explained elsewhere, and that is, as an analogy. A WPS for welding is not unlike a recipe in baking or cooking. If you want to bake a cherry pie from scratch, for example, you would most likely want to follow a recipe. Not just any recipe, but one that has been proven to produce a great cherry pie. After all, not all recipes are good recipes. A good recipe would tell you things like what kind of ingredients you’ll need, the amount of each ingredient, the order in which to put those ingredients together, what to put them into when mixing them, how long to bake it and at what temperature to bake it. The recipe may even include instructions for cooling time after baking. It would most likely give you more than enough information for your pie to be a huge success. Once all of that has been completed, and if you followed the recipe correctly, the cherry pie is ready to be enjoyed. And it’s probably nearly identical to all the other cherry pies that have been made using that recipe. And, that’s not so different from the purpose of a WPS. I won’t get into all the different national or international codes and standards that govern WPSs. There are all kinds of things that are part of a WPS called essential and non-essential variables that would become very specific to the industry that you may be in. For now, I’m going to discuss a WPS in very general terms.

Typically, there are two types of WPSs. Prequalified and those qualified by test. The test record is called a Procedure Qualification Record or PQR. I won’t get into detail on PQRs here either, but as the name implies, it’s a record of the exact parameters, no variables, used during the qualification process. I should tell you that not all codes allow prequalified WPSs, so it will up to you to figure out what you need to do to comply with your requirements. Once you’ve...
A “WPS.” What is that? continued from page 6

established what your exact requirements are, you’ll be on your way to producing a WPS. But I still haven’t told you what a WPS is. Well here you go. A WPS tells the welder everything he needs to know to produce a weld that has been proven to be effective for the intended design conditions. Don’t get this confused with instructions. A WPS is not an instruction manual, a training manual or a “how to” guide for welding. If someone is not a skilled or qualified welder, a WPS won’t turn them into one. Nor will the welds produced by an unskilled, unqualified welder miraculously become acceptable just because they used a WPS. No, a WPS simply offers a high degree of consistency and repeatability, when used as written, by multiple qualified welders. It does this by grouping base materials with similar chemistry, thereby similar weldability, with the correct electrodes (sometimes called filler metal) and shielding gas (if needed), for the welding process you’re using. Then it will establish a range, or variable, for things like joint type and base metal preparation, base metal cleaning, types of welds (fillets, groove welds, etc.), allowable welding positions (flat, horizontal, etc.), shielding gas mixtures, gas flow rates, electrical characters, travel speeds, wire feed speeds, pre-heat and interpass temperatures, allowable maximum heat input, etc., all intended to produce repeatability in the welded connections. The basic essential and non-essential variables are typically specified within the code or standard you’re working with, but other details may be added to further emphasize weld consistency and repeatability. Again, I want to be clear that a WPS is not a magic wand. Poor weld quality can still happen, even when using a WPS. Just like a cherry pie can be awful even when made to a good recipe. The recipe needs to be followed by someone skilled enough to follow the recipe accurately, just like a WPS needs to be used and followed by skilled and qualified welders. If you have a WPS that works for some welders, but not others, then it’s likely more welder training may be required. If you have a WPS that was qualified by a highly skilled welder that no other welder can follow, then maybe the WPS was qualified with parameters that are too stringent and it needs to be requalified. That happens too, but in all cases, without a WPS a welder is simply guessing at parameters and the weld quality is left to chance. For this reason, all welding codes and standards that I’m aware of require adherence to qualified procedures for the production of welded connections and all welders and welding operators must be tested to a qualified procedure and successfully pass before being considered qualified. The bottom line is, a good WPS will produce repeatable quality in welds by establishing a set of parameters that any qualified welder can use with a high degree of success. If this kind of thing interests you and you’re not already an AWS CWI you may want to consider becoming a CWI. If this is a career that you would like to pursue, the AWS-Detroit Section is hosting two AWS CWI Seminars/Exams this year. The seminar/exam dates and location are as follows:

**CWI Seminar June 3-8, 2018**
Exam June 9, 2018

**CWI Seminar Sept. 30-Oct. 5, 2018**
Exam October 6, 2018

**Washtenaw Community College**
4800 E. Huron River Dr.
Ann Arbor, MI 48105-4800

Check the AWS-Detroit e-Bulletin often for other helpful information, at [www.awsdetroit.org](http://www.awsdetroit.org). For more information on how to become properly trained and certified by the American Welding Society and to register, you can visit [www.aws.org/certification](http://www.aws.org/certification).
Q: “My company is in the process of quoting several new assemblies that require resistance spot welding and I am concerned that the specified widths of the flanges are too small for the required electrodes. Are there sources for flange width design recommendations that I can reference so as to determine whether or not the proposed concept is capable of supporting the required resistance spot weld?”

A: “As discussed in our previous columns (Ref. Feb & Mar-18 ATWE), the subject of a required minimum flange width is a source of continual debate within the resistance welding community. To illustrate this point, several design recommendation sources were referenced (AWS C1.1, RWMA Manual, etc.,) to show that no one really agrees on what the proper flange width should be. With that as background, this column will start to illustrate some of the variables that tooling and product designers should be aware of as they determine how much flange width is necessary to support a proper resistance spot weld (RSW).

To better understand the relationship between the welding flange and where the actual weld ends up, it is necessary to identify and understand the different variables, or elements, that contribute to the required minimum flange width. To a varying degree, all of them are present and have an effect every time a weld is made. However, as is common in the analysis of a complex and dynamic situation, the hard part is often not identifying the elements that contribute to process variability, but rather the effect, or contribution, that each individual element has on the total variability.

An example of the potential complexity one must deal with when trying to determine the significance of any one variable is illustrated by just attempting to analyze the geometry on a truncated cone (or A-nose) electrode cap as it relates to welding near an upturned flange (blue line in Figure-1) that is bent greater than 90°. The representation in Figure-1 details a generic electrode cap/welding flange interface and the identified geometric elements that can affect mathematically how one determines the required minimum width.

For the record, this analysis was part of a research project undertaken by someone far more adept to the nuances of welding and statistical analysis than myself (see acknowledgements below), and I only am using this figure to illustrate the degree of difficulty one could encounter if it is decided to undertake this sort of project yourself – Good Luck!

That being said, this generic electrode cap/welding flange interface will be further used to illustrate the actual tolerance that must be considered and the identified elements that can affect the required minimum width. These elements are named below.
- Maximum Electrode Face Diameter (MFD)
- Assembly Positional Tolerance (APT)
- Electrode Positional Tolerance (EPT)
- Expulsion Dam (ED)
- Cut Flange Tolerance (CFT)

We will go into detail about each of the aforementioned tolerances in our next column.”

Acknowledgement:
I would like to thank Tom Morrissett, former AWS D8 chairman, for his invaluable perspective on minimum flange width requirements, and his ability to use Excel.

Figure-1: Example of electrode clearance geometry. The flange is the blue line and the expanded area is shown within the red circle.

References:
2) AWS C1.1M/C1.1:2012, Recommended Practices for Resistance Welding

If you have more questions about this topic, contact Don Maatz at:
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March Meeting Re-cap

The Detroit Section hosted the Patrons/Technical Night March 15, 2018 at IPG Photonics (46695 Magellan Drive, Novi, MI 48377). Mr. John Sutter, executive committee member from the Detroit Section, presented the certificates to all the Patrons, 7 of which were present. Dr. Webster, General Manager & CTO of IPG Photonics (Canada) gave a presentation regarding the state-of-the-art inline coherent imaging technology to monitor the keyhole laser welding process. This technology provides a direct in-line measurement of the keyhole penetration, joint geometry profile for the high-speed laser welding process, along with its seam tracking function, simultaneously. The combination of functionalities given by this technology brings a significant advancement of quality monitoring for the laser welding process. A demonstration of this technology was presented after Dr. Webster’s talk. In addition, Mr. Mike Klos, General manager of IPG Photonics (Midwest Operations) also gave a brief introduction of IPG’s history. There were around 30 people in the audience.
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