American Welding Society®
DETROIT SECTION

e-Bulletin

NOVEMBER 2025

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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.

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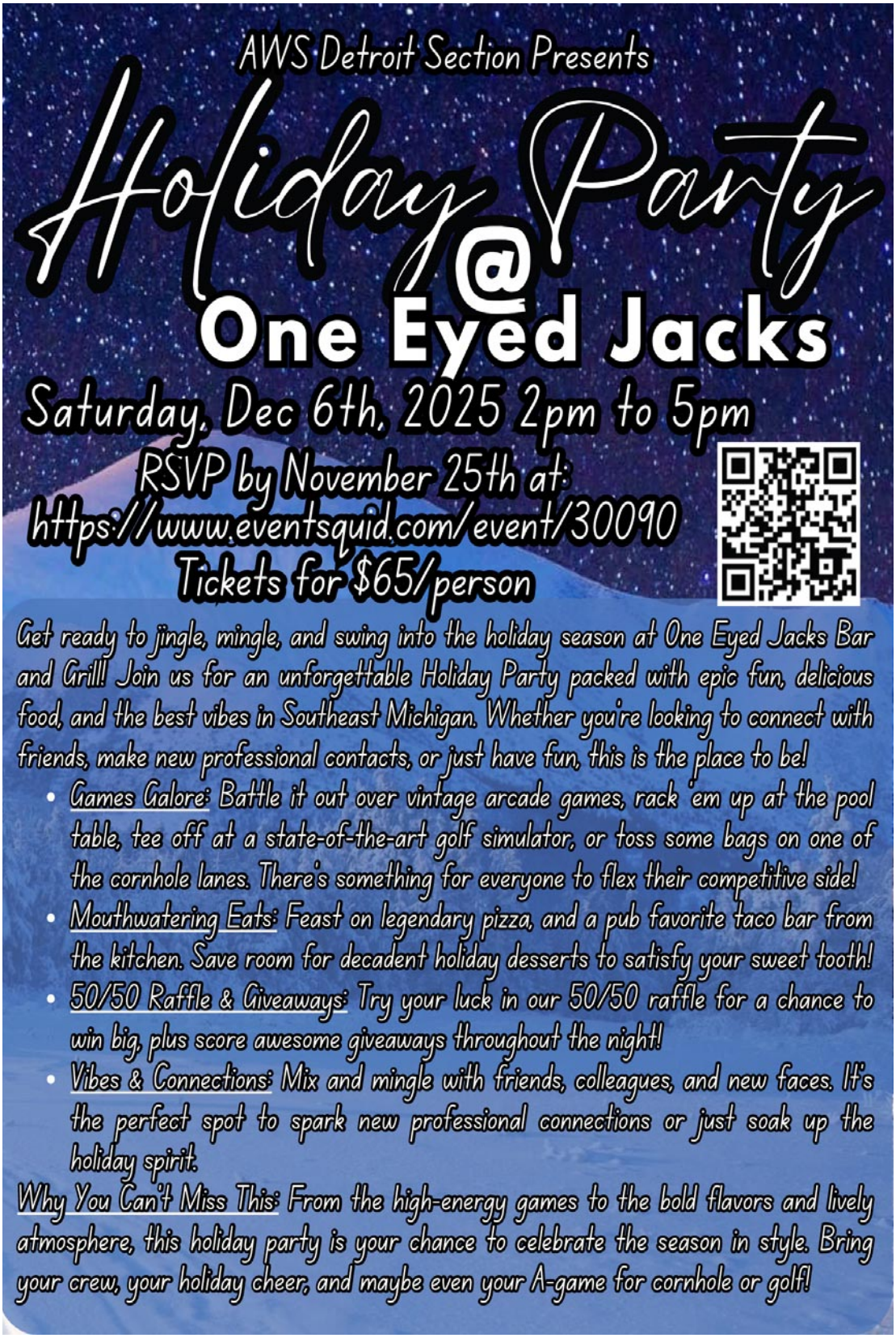

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Chairman's Message
Donnie Crist

Hello AWS Members and Friends,

It's hard to believe that November is already here!

On Thursday, October 23rd, CenterLine hosted the Detroit Section Technical Meeting at Wayne State University's College of Engineering auditorium. Kyle Meloche from CenterLine delivered an excellent presentation on the latest Versa Force Clinch Press solutions. We had a great turnout, and Kyle's insights into mechanical joining were very well received. Thank you to Kyle and the entire CenterLine team for their support and for sharing their expertise.

During the meeting, we also had the privilege of honoring the late Bruce Kelly. Bruce's family joined us as we posthumously presented him with the District Meritorious Award in recognition of his more than 40 years of dedicated service to the Detroit Section. Bruce served on numerous committees and as an RWMA instructor, leaving a lasting impact on our welding community.

Looking ahead, our next Technical Meeting will be held in January and promises to feature an exciting topic. Stay tuned—details will be announced in next month's E-Bulletin.

Before then, we hope you'll join us for some holiday cheer at the **AWS Detroit Section Holiday Party**, which will take place on **Friday, December 6th**, from 2 to 5 PM at One Eyed Jacks in Shelby Township. This event will be a great opportunity to relax, reflect on the year, and enjoy the company of fellow members and friends. Be sure to mark your calendars—registration will open soon!

Thank you all for your continued support of the AWS Detroit Section. I look forward to seeing you at our upcoming events.

Warm regards,
Donald Crist

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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Ask the Welding Engineer

By Donald F. Maatz, Jr.

Projection Types

Q: ***"What options exist for evaluating the quality of a weld nut, other than push-off, and how viable are they?"***

A: "Our previous columns (ATWE Nov-24 thru Jan-25, Mar-25 & Oct-25) started a broad look at projection welding (PW). As stated in these earlier submissions, while the initial question related to the important topic of PW quality, it will take us some time to get there as, from my perspective, we need to establish a few important things about the PW process. To date we have touched on a few of the challenges. These would include the varied material coatings, gauges, and substrate strengths one is asked to weld on. We also reviewed the weld schedules and equipment needed to attach these fasteners. We then reviewed the potential variability associated with these projections by reviewing a specific projection type. We now take a brief look at the history of the PW process, especially with regard to forged/coined projection welds nuts, so we can better understand how we got to this point.

A bit of history…

As is typically the case, a look back at the beginning of the PW process with regard to forged/coined projection welds nuts is more than a bit revealing, especially with regard to the design of the projections themselves*. The earliest rendition of what was to become a weld nut were really just square pieces of steel with a threaded hole in the center. This initial version of a weld nut then had its corners rolled into rough points. These four (4) turned down corners acted as concentration points for the force and current. It was fine folks at the Budd Company in Philadelphia that came up with this idea, as near I can tell, back in in the late 1920s. And thus, the idea of forged/coined projection welding came to be.

The notion of welding a fastener was an idea that quickly caught on in many other manufacturing circles, especially amongst the US automakers. As automotive production scaled up post-WWII, manufacturers sought faster, more reliable ways to attach threaded fasteners to sheet metal, and forged/coined projection weld nuts seemed like the answer. But this is where the story breaks into two (2) parts.

- The first is that many different and talented folks began the development work to better understand this new process. As a result, there were entire labs at Budd, Ford, General Motors, and others, trying to better understand how this new way of attaching a fastener could benefit what they did. Their work bore fruit and the process became popular, and its applications more numerous.
- The second issue is really a direct off-shoot of the first – All of the companies doing this development work did so independently. As a result, the design of the weld nuts, or more importantly the projections, they came up with were all different. And after absorbing all of that cost, none were in the mood to share what they had learned.

Figure-1 – Projection weld nuts - Examples

How should we weld 'your' weld nut?

As was the case with all aspects of welding development, the manufactures took great pride in their work, publishing numerous standards covering almost all aspects of their efforts. You can still find folks today (myself included) that remember these standards, almost holding them with a degree of reverence. Names like W-Standard, Red Book, or Blue Book, etc. come to mind. And while these standards were cutting edge, there was one thing missing from almost all of them – Any relevant data on how to weld their specific weld nuts. The weld nuts themselves were often spec'd out, just not how to join them to a base material.

To this day there are still very few published sets of data for the projection welding of weld nuts. The RWMA manual and AWS standards offer good information on stamped steel (embossed/hollow) projections in most lower strength steels (think UTS <350 MPa). However, they offer nothing on actual forged/coined projection weld nuts.

"Projection Types" *continued on page 8*

"Projection Types" *continued from page 5*

This lack of formalized information is not due to any fault of their own. Instead, the culprit lies with the extreme proliferation of projection weld nut and stud designs over the last 80+ years.

There is currently no movement underway to create a 'common standard' for all of these variations, and I do not see one happening any time in the near future. But credit where credit is due: There is a company in Ohio (**Buckeye Fastener**) that has published some general weld parameter information for some of their standard weld nut and stud offerings.

BOTTOM LINE: The wide variety of projection designs *(Ref. Figure-1)*, and the lack of specificity on how to weld them, will continue to this day.

We have now seen a bit of how we have gotten to where we are at with the PW process. In our next column, we will attempt to design a weld nut, and learn what challenges one faces in this area."

**The utilization of hollow/embossed projections pre-dates forged/coined projection welds nuts by many years. This process, the original projection welding, came about due to work by the inventor of the resistive welding process, Elihu Thomson.*

If you have more questions, contact Don at:
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