American Welding Society®
DETROIT SECTION

e-Bulletin

OCTOBER 2025

Inside This Issue

SAVE THE DATE
– AT A GLANCE –

Oct. 23: October Technical Meeting co-hosted by Wayne State Univ. Welding and Metallurgical Engineering AWS Student Chapter

Oct. 25: CWI Roundtable Schoolcraft College at MEC Bldg, 13001 Merriman, Livonia

Dec. 6: Holiday Party at One Eyed Jacks

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
THE ENGINEERING SOCIETY

AWS-Detroit Technical Meeting

Thursday, October 23, 2025
at

WAYNE STATE UNIVERSITY

College of Engineering Auditorium
5050 Anthony Wayne Dr, Detroit, MI 48202
5:30-8:00pm

centerline®

Presentation by Kyle Meloche, Product Manager at CenterLine (Windsor) Limited

PLEASE JOIN US for the October Technical Meeting at Wayne State University, hosted by the Wayne State Student Chapter of AWS, featuring a presentation by **Kyle Meloche, Product Manager at CenterLine (Windsor) Limited**.

Kyle will discuss the growing demand for clinch fasteners, driven by the increasing use of lightweight materials, the need for water-tight fastener applications, and the role of advanced process monitoring in ensuring joint integrity.

Learn about a recent application involving Profil RND Rivet Nuts, where a sealed fastener joint was critical to the assembly. Although the part appeared visually acceptable, force vs. distance signature analysis revealed a deviation in the preformed hole preparation that would have compromised joint performance, highlighting why visual inspection alone is insufficient.

Kyle will also introduce **VersaForce Clinch Press Solutions,** CenterLine's latest innovation in pressing and piercing. Powered by a servo pump actuator system, VersaForce delivers:

- Precise controllability
- Reliable high force output
- Efficient operations
- Safety
- Smart-real-time force vs distance analytics

This integration-ready solution features a reimagined Air-Over-Oil cylinder, where a closed-loop oil system and servo motor enable soft-touch verification and force-controlled clinching. The system intelligently halts the process if the force signature deviates, ensuring consistent, high-quality fastening and eliminating reliance on tribal knowledge.

To **RSVP,** please visit **https://www.eventsquid.com/event/29623**

Chairman's Message
Donnie Crist

Hello AWS Members and Friends,

September proved to be an especially busy month for our section, with both Student Night and FABTECH taking place earlier than usual, within the first two weeks.

On September 4th, we hosted Student Night at Wayne State University. This year, 31 scholarships were awarded, totaling $64,000, and supporting students across six universities and community colleges. It was inspiring to see the next generation of welding professionals recognized for their achievements.

The following week, I had the opportunity to attend FABTECH at the McCormick Place in Chicago. Industry leaders and innovators were on hand showcasing the latest advancements in cutting, welding, and forming technologies—an impressive display of where our industry is headed.

Rounding out the month, on September 25th our section held the annual golf outing at the Lakes of Taylor Golf Club in Taylor, Michigan. A very special thank you goes to Mike Remer, Kurt VanDonkelaar, and Brian Peterson for their hard work in organizing this event. While it's always a fun day of networking and camaraderie, it also requires a tremendous amount of planning and effort behind the scenes—we greatly appreciate it.

Looking ahead, please mark your calendars for **Thursday, October 23rd**. CenterLine will host the Detroit Section Technical Meeting at Wayne State University's College of Engineering auditorium. Kyle Meloche from CenterLine will present on the latest Versa Force Clinch Press solutions—this will be an excellent opportunity to learn about cutting-edge technology directly from industry experts.

Finally, be on the lookout for details regarding our November Technical Meeting. Plans are still being finalized, and we'll share updates soon.

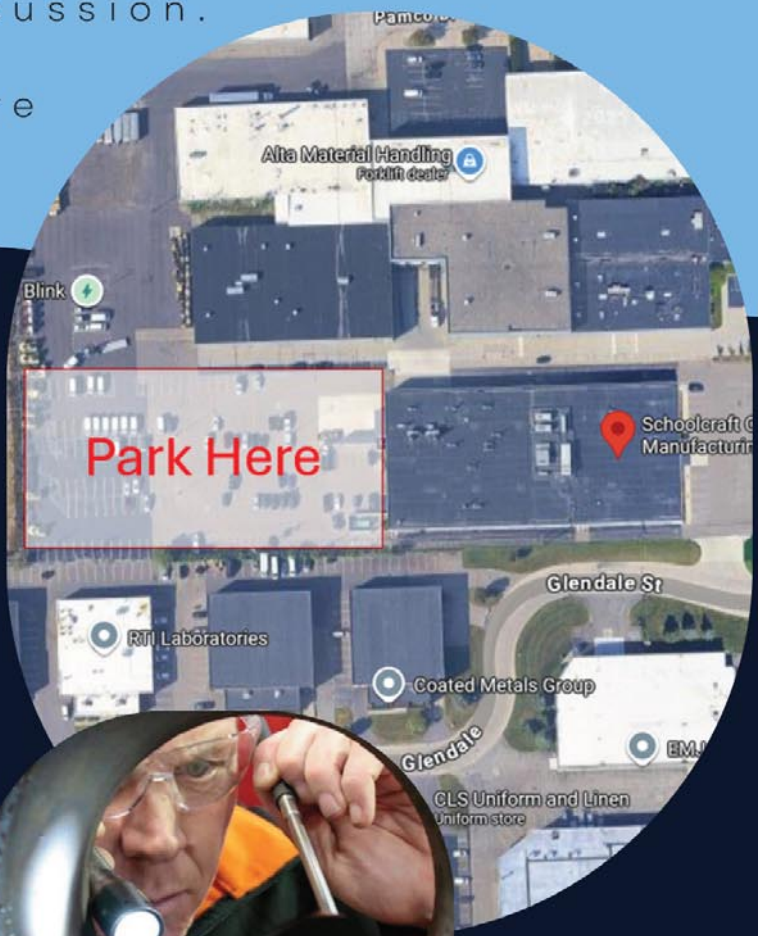
Thank you all for your continued support of the AWS Detroit Section. I look forward to seeing you at our upcoming events.

Sincerely,
Donnie Crist
AWS Detroit Section Chair

Presented by
AWS Detroit Section

CWI ROUNDTABLE

Connect with industry peers for an interactive discussion. Share insights, tackle challenges, and explore innovations.



Saturday
October 25th, 2025

9:00am - 11:00am

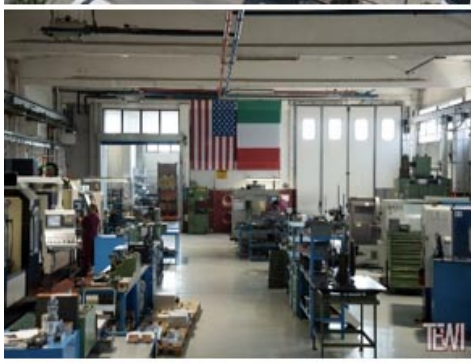
Schoolcraft College
MEC building
13001 Merriman Rd
Livonia, MI 48150

1 PDH hour certificates available to those interested

THE SCHEDULE:

- 9 to 9:30 - Coffee, Donuts, and Networking (oh my!)
- 9:30 to 11 - Discussion

RSVP to erin.e.lalinsky@gmail.com



MILCO MANUFACTURING Celebrates 75 Years of Innovation and Excellence

The year was 1950. *Gas was 18¢ a gallon, America's population was 150 million, Harry Truman was president — and two Detroit-area machinists decided to form a partnership that would change the world of resistance welding. Roy Beach and Clyde Slade leased an abandoned hamburger stand in Warren, Michigan and got to work. Their earliest projects included machining copper castings for resistance welding guns — work that led them to their ultimate destination. By 1953, they were building complete weld guns, and business was booming. Milco quickly outgrew its first shop and, in 1955, moved into a newly constructed facility on the site where the company proudly operates today.*

From those humble beginnings, Milco's customer base grew to include the Big Three automakers and leading Tier One suppliers. Soon, Milco weld guns could be found all over the globe — from the United States to China, Spain, and Mexico — with installations spanning more than 20 countries.

Roy and Clyde understood that serving every aspect of their customers' needs was the key to long-term success. Milco began designing and building cylinders, adding copper components, and expanding engineering capabilities — all while maintaining its commitment to manufacturing the finest quality products in the USA.

The mid-1970s brought a new generation of leadership. While disco and leisure suits were in style, Chuck Beach and Ed Slade took the reins, guiding Milco through another era of growth. In 1979, the copper components division was spun off into Welform Electrodes, which continues to thrive as a sister company.

Through the 1980s and 1990s, Milco continued to lead innovation. From installing equipment at Beijing Jeep (a Chrysler joint venture) during China's opening market, to introducing our proprietary Modular Weld Guns in the 1990s — advances that set new standards for quality and reliability — Milco was always ahead of the curve. During the mid-1990s, owners Chuck Beach and Ed Slade promoted **John Pippin Jr. to General Manager** to help guide the company to its current position in the market. John's leadership and dedication have been instrumental to Milco's continued growth, and today he proudly celebrates **43 years with the company**. Recent years have brought even greater momentum.

In 2023, Milco expanded its European presence with the acquisition of **Tewi in Turin, Italy**, strengthening our position as a global leader in resistance welding solutions. And in 2025, the opening of **Milco Welform de México** further expanded our international footprint, bringing us closer to customers in one of the world's most dynamic automotive manufacturing regions.

Today, in 2025, Milco proudly celebrates **75 years of innovation, craftsmanship, and customer commitment**. With Jeff Beach — the third generation of family leadership — guiding the company, Milco continues to build the most technologically advanced resistance welding equipment in the world.

From a small shop in Warren to a global leader, Milco's story is one of resilience, vision, and partnership. For 75 years, our success has been powered by the dedication of our employees, the trust of our customers, and the legacy of innovation set forth by our founders.

Here's to the next 75 years of shaping the future of resistance welding.

Happy 75th Anniversary, Milco Manufacturing!

A MESSAGE OF GRATITUDE

As we celebrate this milestone, we extend our heartfelt thanks to our employees — past and present — whose skill, dedication, and innovation built Milco's legacy. To our customers and partners around the world, thank you for placing your trust in us and allowing us to grow alongside you. Together, we look forward to building the next chapter of excellence in resistance welding.

INSIDE THIS ISSUE

Patrons 2025-26

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.

Weld Nut Geometry

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) 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 included a look at the weld schedules and equipment needed to attached these fasteners.

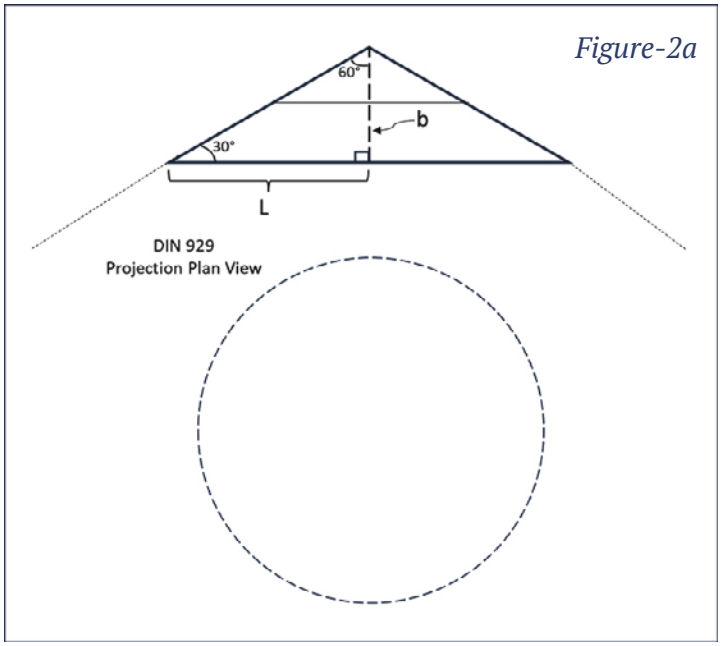
Figure-1: Projection weld nuts - Examples

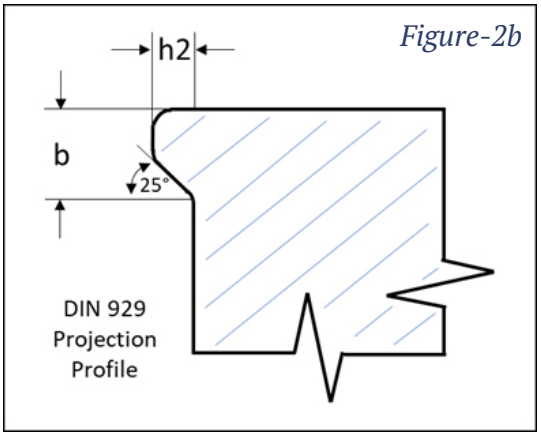
In keeping the aforementioned in mind, it is time to further our review of PW with a discussion on how to characterize the actual projections we are being asked to weld on these forged/coined fasteners. Please see Figure-1 for examples of several different types of common weld nuts, and more importantly, the projections associated with each of them. We will touch on the various types of projections at a later date. But for now, we will focus on just one and see how it can affect the outcome of resistance welding on a fastener of this type.

For purposes of this article, we are profiling portions of the DIN 929 standard for a M10 weld nut. The elements in this standard detail the specific requirements associated with the manufacture of this unique type of forged/coined weld nut, to include the projections. In the case of the DIN 929, the projections have a sloped triangular shape. It should be noted only two (2) of the possibly many different ways to dimension the actual projections have a tolerance. Reference Figures-2a/2b for more details.

- The projection height (h2) is required to be held to a tolerance of +0.0/-0.15 mm*
- The triangular area formed at the base of the projection is defined with a distance (b) and has a tolerance of ±0.3 mm. We will focus our attention on this element for the balance of our discussion.

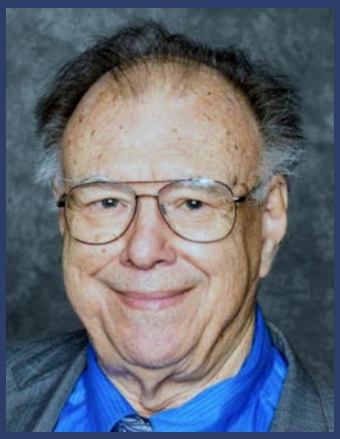
At first glance, a tolerance of ±0.3 mm seems like a reasonable value. However, if one takes a bit of a deeper dive and actually determines what this tolerance represents, you will discover it allows for a wide variance in specific physical values that have a direct impact on our ability to attach the fastener with the PW process. Allow me to elaborate...





Figures-2a/2b: Projection geometry layout from DIN 929

"Weld Nut Geometry" continued on page 9



Bruce Gordon Kelly

1938 - 2023

In 2023, AWS Detroit lost a loyal, hard-working supporter and welding legend of many years, Bruce Kelly.

*At the **October 23 Technical Meeting** we will be presenting a DISTRICT MERITORIOUS AWARD posthumously to his family:*

"In recognition of loyalty, devotion to the affairs of the Society, effective service, and for generous contributions of time and effort."

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"Weld Nut Geometry" *continued from page 4*

For the following calculations, please reference Figure-2a. For this exercise, we will be altering the value for 'b' by the allowable ±0.3 mm, and determining the potential change to the area of the projection's base.

DIN 929 (M10x1.25)

b = 1.25 ±0.3 mm → 0.95 (Low) to 1.55 (high) → ±24%

Tan(θ) = opposite / adjacent → Tan(30) = b / L → L = b / Tan(30) = b / 0.577

- L_{Low} = 0.95 / 0.577 = 1.65 mm
- $L_{Nominal}$ = 1.25 / 0.577 = 2.17 mm
- L_{High} = 1.55 / 0.577 = 2.69 mm

Area = ½ base * height = ½(2L) * (b) = L * b

- $Area_{Low}$ = 1.65 * 0.95 = 1.57 mm^2
- $Area_{Nominal}$ = 2.17 * 1.25 = 2.71 mm^2
- $Area_{High}$ = 2.69 * 1.55 = 4.17 mm^2

Δ Area

Δ Low → Nominal - Low = 2.71 - 1.57 = 1.14 mm^2

Δ High → High - Nominal = 4.17 - 2.71 = 1.46 mm^2

Δ Low from Nominal = 1.14 / 2.71 = 42%

Δ High from Nominal = 1.46 / 2.71 = 54%

As detailed above, the allowable changes to the distance (b) of ±0.3 mm translate into values that are ±24% from the design intent. Once one works through all the math, we can see the projection's base area deviation from design intent can be an eye-popping +54%/-42%. It does not take much imagination to see that altering the allowable area by values, in either direction, of over 40% just might have an effect on how well we can attach this fastener by means of resistance welding. But let's get a bit more 'real world' with our numbers.

While we do not typically use this approach for Resistance Spot Welding (RSW), for the PW of forged/coined fasteners we can breakdown the area of each projection we are trying to weld and determine its relationship to the overall weld schedule. For this example, we will focus on secondary weld current.

Once you start doing a bit of analysis on actual projection weld nuts for most steel grades (think M6 thru M10), current values in the range of 350-800 Amps/mm^2 start to crop up**/***. So far so good. However, what if we alter the area of the projection as detailed above?

When we recall the heating associated with Joules Law (see ATWE Dec-20 & Mar-24) is based on the value of the current squared we quickly see that our current concentration (or density as some call it) is going to be all over the place, and not in a good way. If we utilize a baseline of 500 Amps/mm2 we can see how things change.

- $Area_{Nominal}$ = 2.71 mm^2 → (500 Amps/mm^2)

The values for current concentration (or density) at the extreme tolerance for the measurement 'b'.

- $Area_{Low}$ = 1.57 mm^2 → (869 Amps/mm^2)
- $Area_{High}$ = 4.17 mm^2 → (327 Amps/mm^2)

It goes without saying that if one was successfully making a weld on a 'nominal' weld nut, you might find yourself in more than a bit trouble if the next batch of weld nuts arrived on the floor with the value of (b) only changing by half of its allowable amount (think 1.25 ±0.15 mm). And the weld nuts themselves would be well within specification. All that being said, my guess is any resultant quality checks might not be.

There are some scheduling techniques one can use to minimize the impact of these changes in projection area, but not eliminate them. This and other topics will be the subject of future columns.

I very much welcome any additional thoughts and ideas folks may have on this, or any other topic, related to projection welding."

**The actual initial surface contact face of the projection is defined by a fixed angle (in this case, 25°) and will change based on how the values for both projection height (h2) and 'b' change. Someday, I might create a spreadsheet taking into account changes to both of these values and determine how the actual surface contact face changes in relation to the projection volume and base area. Someday...*

***It is acknowledged there is a wide range to these values. Regrettably, it is the nature of the PW process with regard to forged/coined fasteners as detailed in Figure-1.*

****A word of caution with regard to utilizing Amps/mm^2 values with regard to PW. While the fundamentals of force, current and time are the same for both the RSW and PW process, the basic premise behind adjusting these values (See ATWE Mar-24) can be a bit different. As an example, weld force is one scheduling element that factors much more heavily with PW than RSW. And as we discussed (see ATWE Jan-25 & Mar-25), the needed force relates to many things, to include accounting for machine dynamics, substrate strength, and schedule methodology.*

If you have more questions, contact Don at:
Milco Manufacturing Company
2147 E 10 Mile Rd., Warren, MI 48091
dmaatz@milcomfg.com; (586) 427-2414 (Desk)

Donald F. Maatz, Jr. is with Milco Manufacturing, and serves in the capacity of Senior Welding Engineer. 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.

References:

1) DIN 929


AWS Detroit Section Presents
Holiday Party
@
One Eyed Jacks
Save the
Date
Saturday,
Dec 6th, 2025
2pm to 5pm

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);

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