

WELDING JOURNAL



DECEMBER 2024

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On the cover: A student at Northeast Wisconsin Technical College's (NWTC's) North Coast Marine Manufacturing Training Center in the Introduction to Marine Welding class. (Credit: NWTC.)

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AWS Mission Statement

The mission of the American Welding Society is to advance the science, technology, and application of welding and allied joining processes worldwide, including brazing, soldering, and thermal spraying.

AWS Promotes Diversity

AWS values diversity, advocates equitable and inclusive practices, and engages its members and stakeholders in establishing a culture in the welding community that welcomes, learns from, and celebrates differences among people. AWS recognizes that a commitment to diversity, equity, and inclusion is essential to achieving excellence for the Association, its members, and employees.

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Propelling Welders into the Aerospace Industry

Interest in aerospace welding has significantly increased in recent years. Industry professionals and news outlets regularly share advancements and achievements worldwide. These accomplishments and their potential impact have driven many to consider a career in aerospace. The sector also continues to experience sustained growth, which requires more skilled workers. Industry demand and individuals' interest in entering the aerospace industry have led to the development of new courses and training, such as Hobart Institute of Welding Technology's hands-on aerospace welding course.

Aerospace welding uses a variety of welding processes and material types as well as a vast array of parts and components, from flight-critical hardware to simple, noncritical pieces. At the core of aerospace welding is the gas tungsten arc welding (GTAW) process. GTAW was invented in the 1940s to weld aluminum and magnesium for the aircraft industry. Over 80 years later, the GTAW process has grown in versatility and continues to be a mainstay in aerospace manufacturing and maintenance.

The aerospace industry is known for its stringent standards and quality-control measures. Nondestructive examination techniques, such as radiography and penetrant testing, are frequently used to check for defects and ensure parts meet specified requirements. In addition to having strict standards and quality-control measures, aerospace welding also has its own set of challenges. Aerospace welding using the GTAW process can cover a wide range of material types and thicknesses. Materials range in thickness from 0.016 to over 0.060 in. and will likely be specialty alloys designed for high stress, high heat, and specialized applications where reducing weight is critical. These metals have strict welding procedures and preparation requirements, requiring a high level of skill to control heat input and weld size. Focused training is often necessary due to the challenging nature of aerospace welding.

What does training look like? In 2018, Hobart Institute collaborated with its Program Advisory Committee (PAC) to develop a course tailored to prepare welders for the demands of the aerospace industry. With valuable input from the PAC, industry partners, and experienced in-house instructors, the school crafted a two-week introductory course focused on teaching students the fundamentals of aerospace welding. The course emphasizes cleanliness, preparation, and welding procedures for thin-gauge stainless steel sheet and tubing, specifically using the GTAW process. The course is primarily hands-on, beginning with fillet and square groove welds on 18-gauge stainless steel material using a 0.030-in. welding rod. Training gradually increases in difficulty. Students advance to 22-gauge stainless material and practice building skill in both horizontal and vertical positions. While in the course, students get the chance to take a qualification test on a 22-gauge horizontal butt joint that follows AWS D17.1, *Specification for Fusion Welding for Aerospace Applications*, after which the specimen undergoes radiographic testing. The course becomes more challenging as students are introduced to butt joints on 3/4-in.-diameter stainless tubing in the 6G position. They are trained to use orbital cutting devices and facers to trim and prepare the tubes for a proper fit-up. A borescope is used during practice and testing to assess the root side of each joint. In the final training phase, students learn about tube-to-sheet welding in the 2F and 5F positions. These configurations are very difficult and help students further their understanding of how to manage heat input and control distortion.

In addition to providing training, Hobart Institute also helps students find employment. The school's Pathways Welding Program allows students to take part in numerous career advising sessions and gives them the chance to connect with potential employers at job fairs as they get ready for welding jobs after graduation. The Institute's aerospace training graduates have secured excellent opportunities with companies like General Electric, Blue Origin, SpaceX, Magellan, Barnes Aerospace, and others, working in clean, climate-controlled facilities, welding parts and components for today's aircraft and spacecraft. [WJ](#)



Charles Carpenter
Director of education,
Hobart Institute of
Welding Technology

“Interest in aerospace welding has significantly increased in recent years. Industry professionals and news outlets regularly share advancements and achievements worldwide. These accomplishments and their potential impact have driven many to consider a career in aerospace.”

THE UNITED STATES JOINS THE WINNER'S CIRCLE AT **WorldSkills Lyon 2024**

U.S. competitor Wyatt Hansen welds his way to a bronze medal

BY ALEXANDRA QUIÑONES



The 2024 WorldSkills Competition welding winners: (from left) Zehong Hu (silver), Sanghyeok Lee (gold), Wyatt Hansen (bronze), Ben Rainforth (bronze), and Harrison Field (bronze). (©WorldSkills International)

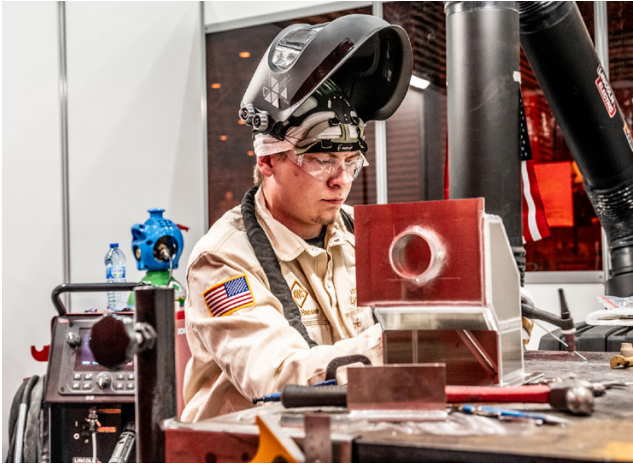
The 47th WorldSkills Competition took place in Lyon, France, from September 10 to 15, bringing together 1400 competitors from 69 countries and regions to compete in 62 skills. The competition welcomed 250,000 visitors, including students, international delegations, families, professionals in search of future employees, young people interested in vocational training, people looking to retrain, and many others. Held every other year, the event encourages young people's development in vocational training and creates future generations of skilled talent.

Wyatt Hansen represented the United States in the welding competition and took home the bronze medal, making this the second consecutive competition that the United States has won a medal in welding since 2013. Sanghyeok Lee, Korea, won the gold medal; Zehong Hu, China, won the silver medal; and Ben Rainforth, Canada, and Harrison Field, Australia, also took home bronze medals.

"It's been an honor being able to represent the United States of America at the 47th WorldSkills," Hansen said. "I brought home the bronze medal. All of the hard work, time, and dedication paid off. Thanks to everyone who helped, and thank you to all my sponsors as well."

The Welding Skill Competition

The welding skill competition is based on four modules that must be completed in 18 hours over three days. Module one consists of two test plates, two fillet weld tests, and one test pipe to be welded with either shielded metal arc welding, gas metal arc welding, gas tungsten arc welding (GTAW), or flux cored arc welding, or a combination thereof, in a selected position. The position and welding processes are unknown until familiarization day. The coupons get nonde-



Hansen put his many hours of training to use at WorldSkills Lyon 2024. (©WorldSkills International)

structively and destructively tested for assessment. Module two features a pressure vessel to be welded with all the aforementioned processes in position. The pressure vessel gets visually assessed and hydrostatically tested to 1000 lb/in.². Module three comprises an aluminum sheet metal project to be welded in position with the GTAW process. Module four consists of a stainless steel sheet metal project to be welded with the GTAW process. Both modules three and four receive a visual assessment.

Guided by his technical expert, Ray Connolly, Hansen trained roughly 95 hours a week beginning in the summer of 2023, when he was chosen to be a part of the AWS WorldSkills Competition Committee's U.S. Pre-Trials Selection process. Some weeks, Hansen trained on multiple competition simulations, while other weeks, he worked on individual modules to identify weaknesses, followed by specific training on those weaknesses. Despite the many hours of hands-on work, Hansen found the mental aspect of training to be the most challenging.

"You have to have the right people behind you helping you with your mental game. The mental game makes or breaks this competition," Hansen said.

In this case, his mettle triumphed over metal in securing a place in the winner's circle, a victory that Connolly was proud to see.

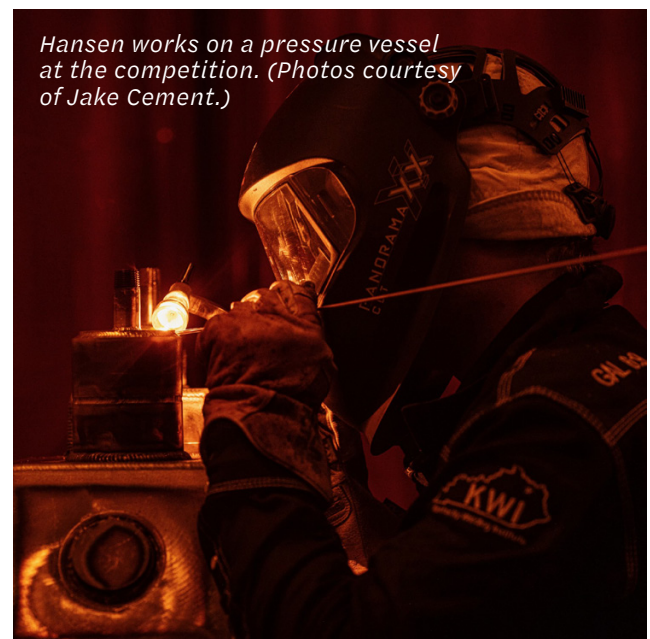
"It was a great pleasure and honor to witness him grow and advance his skills over the last year and to see his dedication and talents pay off in the end," Connolly said. "The AWS WorldSkills Competition Committee and I have been working with Wyatt since the summer of last year . . . He's an extremely dedicated and hard-working individual who will be welcomed in our AWS committee with open arms to help the U.S. continue medaling at the WorldSkills Competitions."

ALEXANDRA QUIÑONES (aquinones@aws.org) is associate editor of the *Welding Journal*.

What's on the Horizon

Hansen recently graduated from Utah State University Eastern, Price, Utah, with an associate of applied science degree in welding technology. He plans to work for a few months and then return to school to get his welding engineering degree at Weber State University, Ogden, Utah. He's also working on starting his own welding business on the side. He plans to use the same dedication that earned him bronze at the WorldSkills Competition to serve him well in future endeavors.

"I've had this goal [of winning a WorldSkills Competition medal] since I was 13 or 14 . . . So, finally, I accomplished this goal," Hansen shared. "To get here and compete, it's a huge milestone. I hope to make all my other new dreams and goals a reality just like this one." [WJ](#)



Hansen works on a pressure vessel at the competition. (Photos courtesy of Jake Cement.)



3 Essential Strategies for Advancing in Your WELDING CAREER

Boost your career growth with these tips

To continue growing in your welding career, you must have a lifelong commitment to learning, whether by staying current on industry trends, taking online courses, or achieving industry certifications. In the final installment of The American Welder's job series (see the March 2024 *Welding Journal* for how to market yourself for the job, the June 2024 issue for the dos and don'ts of interviewing, and the October 2024 issue for the soft skills needed to retain employment), we take a look at three ways to keep growing in your welding career.

1. Stay Informed About Industry Trends

The welding industry continues to evolve, so staying informed about the latest developments in welding technology and techniques is essential for career growth. Here are some ways to stay updated.

Join Professional Organizations

Organizations such as AWS provide resources, networking opportunities, and access to industry publications. Becoming a member can help you

connect with peers locally and worldwide, create a community, and help you stay informed about advancements in welding.

Follow Industry Publications, Blogs, and Podcasts

Subscribe to industry magazines, websites, blogs, and podcasts focusing on welding and metalworking. Regularly reading articles can keep you informed about new techniques, tools, and industry best practices.



Attend Trade Shows and Conferences

Participating in welding trade shows and conferences offers hands-on experience with the latest technologies and products. These events often feature workshops and presentations from industry leaders, providing valuable insights into the future of welding.

2. Take Online Courses

The flexibility of online learning makes enhancing your skills and knowledge easier than ever. Here are some benefits of taking online courses:

Access to Expert Instruction

Online courses often feature content from industry experts and experienced instructors. This access allows you to learn from the best regardless of where you are.

Flexible Learning Schedule

Many online courses offer self-paced learning, allowing you to balance your education with work and personal commitments. This flexibility can make it easier to fit professional development into your busy schedule.

Diverse Topics and Specializations

From advanced welding techniques to safety protocols, online platforms offer a wide variety of courses. Explore different welding processes or automation to expand your skill set and adapt to industry demands.

3. Obtain Welding Certifications

Certifications are a valuable asset in welding, demonstrating your skills and commitment to professional development. Here's how to approach certification.

Research Certification Programs

Identify certifications that align with your career goals and the demands of your industry. AWS offers several certifications, including Certified Welder (CW) and Certified Welding Inspector (CWI), that are widely recognized and respected.

Do the Prep Work

Before taking any certification exam, ensure you're well-prepared. Utilize study guides, practice tests, and relevant coursework to reinforce your knowledge. Many organizations and

schools also offer preparatory courses specifically for certification exams.

Maintain Your Certifications

Understand the renewal requirements to stay on top of your certifications. Continuing education and recertification are often necessary to ensure your qualifications remain current and relevant.

Conclusion

Ensuring growth in your welding career requires a proactive approach to learning and professional development. You can enhance your skills and employability in a competitive job market by staying informed about industry trends, leveraging online courses, and obtaining relevant certifications. Embrace lifelong learning and invest in your career to open new opportunities and achieve your professional goals in welding. [WJ](#)

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MAKING SENSE FOR WELDING EDUCATORS

We've Taken the Guesswork Out of Planning Your Welding Curriculum

Why spend hours planning your upcoming welding training curriculum, if someone else has already done the heavy lifting? The AWS SENSE (Schools Excelling through National Skills Standards Education) curriculum is a turnkey framework you can use for your upcoming welding classes.

WHAT IT IS

- ◆ Comprehensive and flexible set of minimum guidelines
- ◆ Modular lesson plan format: choose content and methods to review with your students.
- ◆ Turnkey, online multiple-choice tests and performance evaluations
- ◆ Easily integrate existing program with SENSE curriculum
- ◆ Aligned to industry-recognized national education standards

WHAT YOU GET

- ◆ Advantage when seeking Perkins funding
- ◆ Eight (8) **FREE** AWS reference books for your welding classroom or library (including *Welding Handbook*)
- ◆ Access to SENSEOnline.org for exam administration and automatic test results
- ◆ Complimentary one-year Educational Institution Membership with AWS
- ◆ Complimentary Listing on the AWS.com Welding School Locator

WHAT YOUR STUDENTS GET

- ◆ A way to earn AWS credentials and have their names listed in the SENSE Training Database.
- ◆ AWS SENSE Certificate of Completion and wallet card showing completed process modules.
- ◆ Access to SENSE Online for credential verification

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