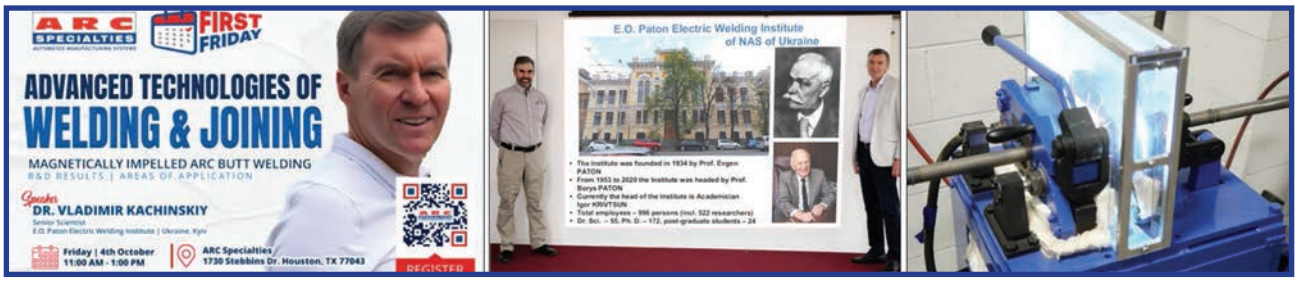
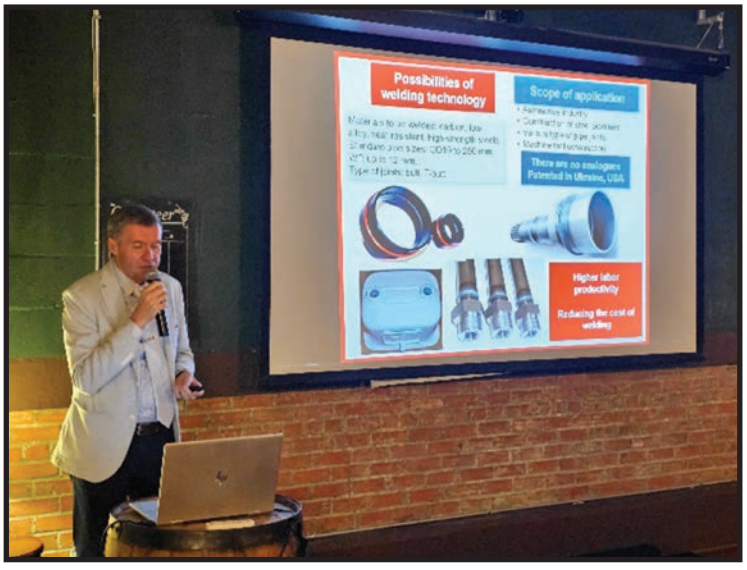
# FABTECH 2024 EXHIBITION

## ARC SPECIALTIES AND ASM INTERNATIONAL

At the invitation of Dan Allford, President of Arc Specialties, Houston, USA, as part of long-term co-operation with the E.O. Paton Electric Welding Institute (PWI), a business visit to the USA was held in October 2024 of Dr. Volodymyr Kachynskyi, a senior scientist at the PWI. The program of the visit included presentations of the latest results of the PWI work on scientific achievements in the development of advanced technologies of welding and related processes such as flash butt welding, electron beam welding and additive technologies, narrow gap welding, manual laser welding, explosion technologies, underwater welding and cutting, electron beam welding in space, high frequency live tissue welding, microplasma spraying, plasma-inductive process of single crystals tungsten growing, method for determination of residual stresses in welded joints, magnetically impelled arc butt welding (MIAB) also their industrial application for the purpose of economic growth. During the visit, presentations were held by Arc Specialties.




**Presentation at Arc Specialties with live demo MIAB welding**




**Presentation of PWI developments for ASM International, Houston, USA**

Arc Specialties is the leading supplier of choice for automated manufacturing systems with over 40 years of experience in 33 countries around the world: from different arc welding technologies, 3D cladding, hardfacing and plasma cutting to material handling, precision positioning equipment and assembly hard automation. And the American Society Metals (ASM International) with the support of Jean-Marc Tetevuide, business development specialist at Har-Bach Fusion Technology Company, for representatives of scientific organizations and industrial companies in the USA. ASM International is an association for attracting specialists in the field of materials science and their organizations to the resources necessary to solve scientific and technical problems in order to achieve the required results. The total number of people present was approximately 120 individuals.

## AMERICAN WELDING SOCIETY

On October 14, the PWI was presented at the American Welding Society (AWS) Annual Business Meeting. During the AWS work, several meetings were held, including with the AWS President in

Meeting with the
Mr. Ernest Levert Sr.,
President of the AWS in 2003

Meeting with Ms. Nancy C. Cole,
President of the AWS in 2013

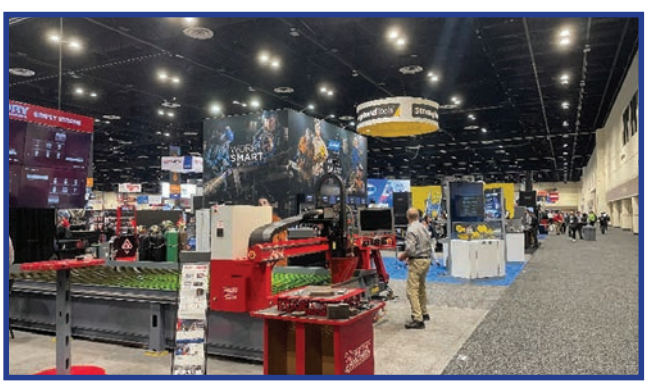
Meeting with Richard Holdren, coming AWS President in 2025, Dan Allford,
President of Arc Specialties and Dr. Volodymyr Kachynskyi, PWI

2003, Mr. Ernest Levert Sr., the AWS President in 2013, Ms. Nancy C. Cole, and the coming AWS President in 2025, Mr. Richard Holdren.

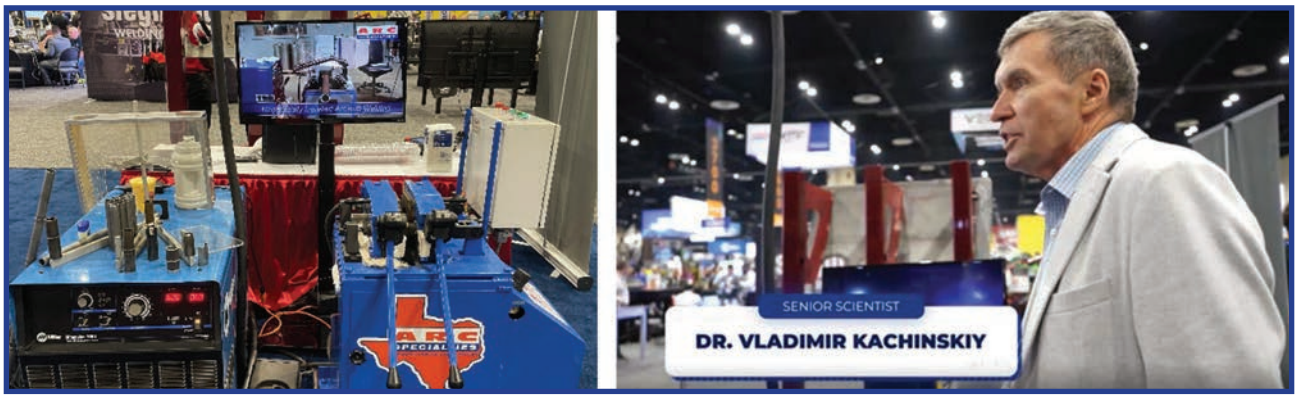
## FABTECH 2024

Additionally, from October 15 to 17, the AWS development, a MIAB welding machine, was presented at the FABTECH 2024 exhibition in Orlando with a demonstration of the welding process. The PWI developed MIAB welding process was included in the 60 coolest technology demonstrations in one video presented at FABTECH, according to the renowned expert Jake Hall, The Manufacturing Millennial. FABTECH Expo is North America's largest metal forming, fabrication, welding, and finishing event.

At the 2024 FABTECH exhibition, over 1,500 companies showcased their products and services to 35,000 exhibitors across 750,000 square feet of exhibit space. Despite the inclement weather caused by Hurricane Irma that impacted Orlando, Florida the week prior, FABTECH was a resounding success. The event attracted a substantial number of exhibitors and attendees, who expressed their optimism about the future of manufacturing globally and in the United States. A notable highlight of this year's FABTECH was the demonstration of collaborative robots (cobots). While arc welding is not traditionally associated with cobot, the collaborative nature of a cobot, coupled with its ability to sense human contact and deactivate before causing harm, enhances the safety of welding operations. Repetitive, routine, and ergonomically challenging tasks can be tedious and hazardous for workers in virtually any manufacturing environment. Cobots can significantly increase productivity levels by automating virtually any manual task, including small batches or quick changeovers. Additionally, cobots can reuse programs to perform repetitive tasks. In the coming years, cobots are expected to witness increased adoption, particularly in welding and cutting applications. This trend is accompanied by a decline in the number of manufacturers, as the current market is overcrowded with new entrants, many of which may not survive beyond a few years. Another area of innovation introduced at FABTECH was 3D printing, or additive manufacturing (AM). While AM is often perceived as a novel technology, welding is one of its pioneering additive technologies. AM is rapidly transitioning from a novelty



FABTECH 2024




**The MIAB welding machine was presented at the FABTECH 2024 with a demonstration of the live welding process by Dr. Volodymyr Kachynskyi**

to a viable manufacturing method. Much of the work involves the use of gas metal arc welding using small wires, a process known as wire-arc additive manufacturing.

While significant research continues in developing codes and specifications for this new technology, as well as measuring material properties in printed parts, there is scope for innovation in the use of other welding processes with higher deposition rates than traditional GMAW. High-performance AM candidates include electroslag and submerged arc welding. There has been a significant emphasis on automating not only the welding processes, but also the automation of part preparation, machining, cleaning, post-weld inspection, and post-weld finishing. Future manufacturing cells will incorporate more processes in a smaller footprint. There is also a noticeable trend away from traditional capital-intensive procurement of large systems toward more accessible, low-cost models. The first model is robots as a service, where the supplier retains ownership and simply provides the equipment for a fee for a limited time. This allows manufacturers to take advantage of robotics without making significant capital investments. This also justifies the use of robots for shorter production runs.

The second model is leased robots. In this model, the manufacturer retains ownership as well as responsibility for monitoring, software updates, and maintenance. It also eliminates the risk of large capital expenditures. It is likely that both of these models will become more common in the industry. At the ARC Specialties booth, we proudly demonstrated several innovative technologies. The first was the concept of deploying traditional robots in hazardous environments, such as drilling ships in the Gulf of Mexico, to replace humans in physically demanding and dangerous tasks. By making robots mobile, numerous opportunities are opened up for working on stationary or excessively large parts that would be economically impractical to move manually. The second was a robot capable of both welding and cutting in the field on a moving magnetic base. This application utilized a collaborative robot, which improved safety and reduced the size of the robot to allow for mobility in tight spaces and single-handed operation.

Our third exhibit showcased MIAB a technology developed by the PWI. We were fortunate to have Dr. Volodymyr Kachynskyi who contributed to its development, present and demonstrate this unique technology. MIAB is relatively unknown in the United States, and visitors were amazed by its ability to weld small diameter pipes in under four seconds, which would typically take hours using traditional methods. Overall, the exhibit highlighted the rapid pace of technological advances. Computers, sensors, and robots are becoming faster, more efficient, and more accessible, allowing us to solve previously impossible problems. Automating quality control allows for greater measurement consistency and maintaining high levels of product quality. The cobot arm's repeatability of +/–0.03 mm (30 microns) is ideal for automating high-precision operations in quality control and testing. However, it is equally important to maintain a clear understanding of welding processes, parameters, and procedures to ensure success. Despite the challenges caused by the COVID-19 pandemic, trade shows remain indispensable platforms for connecting technology providers with end users. As such, we expect trade shows to continue to play a key role in the future of the industry.

**Volodymyr Kachynskyi, PWI, Ukraine,**
**Dan Allford, President of Arc Specialties, USA**