ewm®
WE ARE WELDING

CustomerStory

WAAM
WIRE ARC ADDITIVE MANUFACTURING

WAAM3D works with EWM

Precise welding technology for additive manufacturing

Wire Arc Additive Manufacturing (WAAM) has experienced a significant upswing in recent years. This advanced technology allows complex metal structures to be manufactured efficiently and precisely. The British company WAAM3D, a pioneer in the field of WAAM technology, works with EWM welding equipment to produce high-quality metal components for various industries such as aerospace, energy and shipping.

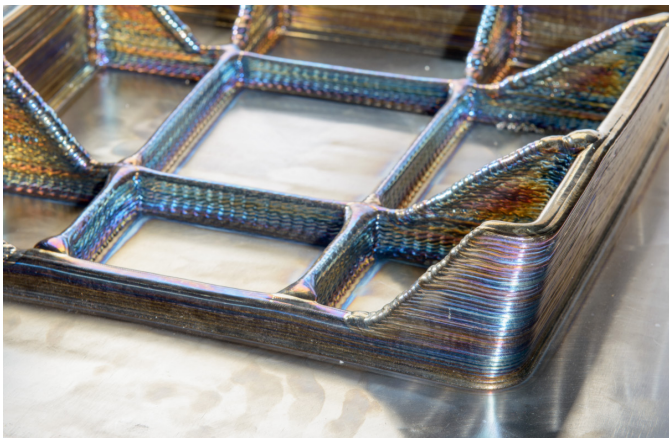
Similar to a 3D printer, only with metal - WAAM technology uses the welding arc as an energy source to melt a metal wire. The melted material is applied layer by layer until the component is finished. The company WAAM3D, based in Milton Keynes/UK, specialises in this field. It was founded as a spin-off from Cranfield University, which plays a central role in the research and further development of WAAM technology. WAAM3D's portfolio includes not only the provision of WAAM systems, but also software solutions, training and customer support for companies wishing to integrate this technology into their manufacturing processes.

WAAM technology uses the welding arc as an energy source to melt a metal wire.

How additive manufacturing with wire works

The additive manufacturing process is based on the principle of arc welding. By applying the liquid wire material layer by layer, WAAM enables the construction of complex metal parts virtually 'from the bottom up'. The entire process is coordinated with robots. The quality of the workpiece depends on the precise control of the process parameters, in particular the current intensity, the wire feed and the movement of the welding head. Depending on the material requirements, various welding processes are used, including Plasma Transferred Arc (PTA) and Gas Metal Arc (GMA). These allow precise control of the heat input so that the molten metal bonds optimally with the previous layer. High build-up rates, wire as an inexpensive and easily available starting material and a very controllable process are the main advantages of the process, especially compared to powder-based processes.

The melted material is applied layer by layer until the component is finished. The entire process is coordinated with robots.



The additive manufacturing process is based on the principle of arc welding. By applying the liquid wire material layer by layer, WAAM enables the construction of complex metal parts virtually 'from the bottom up'.

High demands on the welding process

Additive manufacturing offers many advantages, but also places special demands on the welding technology used. For WAAM3D, it was essential to find a reliable, highly controllable and efficient welding solution to ensure consistent layer formation and high repeatability. Another important selection criterion was the reliability and stability of the welding equipment. As the WAAM process can take several hours or days, the welding power sources must deliver consistently precise results and have a high duty cycle.

Solution: high welding quality and precise regulation

WAAM3D was looking for a powerful, flexible and reliable welding solution and found it at EWM. The company currently uses the Tetrix 352 and 552 for plasma welding; GMA power sources are currently being evaluated. The plasma welding systems from EWM enable precise control of the arc and therefore consistent, reproducible layer formation - a crucial prerequisite for the successful WAAM process. The devices are designed for long exposure times and offer consistent deposition quality. The precise regulation of the power sources ensures that the wire is melted in a controlled manner and bonds optimally with the previous layer. This minimises uneven seam geometries or material defects. Another advantage lies in the flexibility of EWM technology. The plasma welding devices used are suitable for a wide range of materials. However, EWM's welding machines score points not only for their technical performance, but also for their compatibility with existing automation systems. They can be easily integrated into the WAAM3D systems to ensure a continuous, robot-guided production process.

WAAM3D currently uses the Tetrix 352 and 552 for plasma welding, because they enable precise control of the arc and therefore consistent, reproducible layer formation.

Result: EWM welding technology guarantees process reliability .

'Welding technology is at the heart of our manufacturing process,' explains Prof. Stewart Williams, co-founder of WAAM3D. 'With the plasma welding systems from EWM, we have a solution that is not only precise, but also very reliable.' By using EWM technology, WAAM3D has been able to significantly improve process stability and repeatability. The precise control of the welding parameters ensures uniform material application. 'Welding errors are a critical factor, especially with demanding materials such as titanium or Inconel,' continues Prof. Stewart Williams. 'Thanks to the EWM plasma power sources, we can guarantee the consistently high quality of our components.' In addition to the technical reliability, WAAM3D also values the close dialogue with EWM. 'The support from the manufacturer is very important to us,' says Prof. Stewart Williams. 'EWM not only offers high-quality welding technology and fast delivery of spare parts, but also excellent advice and support.'

WAAM is becoming increasingly recognised as an advanced manufacturing process in the industry worldwide. With EWM welding equipment, WAAM3D is optimally equipped for future challenges. The use of GMA power sources from EWM is also currently being examined in order to further expand the possibilities of WAAM technology.

In collaboration with WAAM3D

EWM GmbH | Dr. Günter-Henle-Straße 8 | 56271 Mündersbach
Tel: +49 2680 181-0 | info@ewm-group.com | www.ewm-group.com

Photos:
WAAM3D