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MX3D

Robotic WAAM for medium to large-scale certified metal parts

Factsheet

MX3D: Robotic 3D Metal Printing

With a skilled and agile team in robotics, R&D, engineering, design, and fabrication, MX3D fabricates complex medium to large-scale metal components and provides 3D metal printing solutions from design to certified parts with increased flexibility, faster, and cost-effective.

Company: MX3D
Founded: 2014
Location: Amsterdam, Netherlands
Technology: Wire Arc Additive Manufacturing (Metal Additive Manufacturing)
Industry: Automotive, Construction, Energy, Manufacturing, Maritime, Metalworks, Space, Tooling

MX3D has 8 years of experience with robotic Wire Arc Additive Manufacturing (WAAM). They offer flexible, controlled, and certified digital manufacturing solutions and technology with the highest deposit rate in metal 3D printing and excellent post-printed results. With the biggest WAAM facility in the world, MX3D is the market leader and has more than once amazed the market by shifting the frontiers of WAAM technology. After successfully placing a fully certified 3D printed stainless steel pedestrian bridge in the center of Amsterdam in the summer of 2021, the company is now qualified by Lloyd's Register for its WAAM facility, printing and various materials.

M1 Metal AM System by MX3D

Demonstrator: Optimized Truss by INTEGRADDE Consortium

A set of optimized metal trusses has been 3D-printed with robotic WAAM based on an end-to-end framework for additive manufacturing by the INTEGRADDE consortium. Together with the INTEGRADDE partners, MX3D has developed an innovative production strategy of continuous and integral control of the WAAM process, from product design to final verification, in-line quality assurance for the manufacturing of certified metal parts, and addressing mass customization manufacturing approach.

INTEGRADDE truss in M1 Metal AM System - MX3D

INTEGRADDE truss in M1 Metal AM System - MX3D

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 820776.

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The goal of INTEGRADDE is to develop a novel end-to-end solution and framework for the additive manufacture of optimized structures, paving the way towards certification and consistency in large-scale robotic Wire Arc Additive Manufacturing (WAAM) in strategic metalworking sectors.

The bespoke, optimized and WAAM-printed truss offers an intelligent and innovative perspective for the future of the architecture, engineering, and construction (AEC) industry due to a mix of several benefits connected to WAAM: (a) smart manufacturing by decreasing operating costs and time to market, (b) delivering complex, customized and flexibility in design without increasing manufacturing costs, (c) reducing environmental impact by significantly lowering material use and waste, and (d) reducing assembly time and costs. With these benefits, the INTEGRADDE truss shows a state-of-the-art optimized design that allows reconfiguration, large-scale projects, and adequate material performance.

Robotic WAAM by M1 Metal AM System

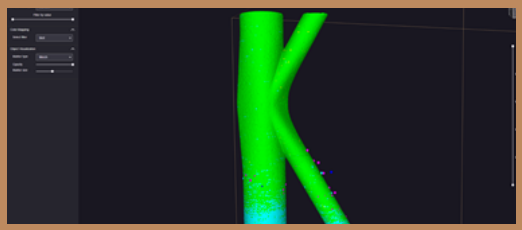
FLEXIBLE

Based on extensive research and collaborations, MX3D has launched a turnkey robotic WAAM solution, the M1 Metal AM System. M1 is built for WAAM. It offers a full end-to-end solution to get started with WAAM fast and print high-quality parts in-house. The 8-axis robotic system runs on the company's proprietary software MetalXL and comes with an integrated control system that monitors and logs all relevant parameters using real-time connected sensors. The system has automated calibration routines built in to minimize downtime during non-stop production

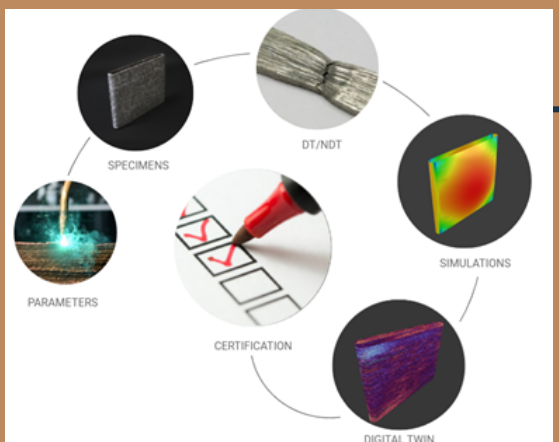
CONTROLLED

MetalXL is built by MX3D to enable 3D metal printing of large metal parts in-house, using robotic WAAM technology. Its streamlined end-to-end workflow allows users to easily manage the whole printing process from design to print. It offers diverse features to both print with pre-set metal alloys and process parameters, or customize the entire process to your own needs. MetalXL joins an off-the-shelf industrial robot and welding machine and transform it into an industrial-grade 3D metal printing system.

Control System MetalXL



MX3D's MetalLive and visualization of data



INTEGRADDE: a product-driven engineering approach from design to certification for robotic WAAM

CERTIFIED

In 2021, Lloyd's Register awarded MX3D a certification for their directed energy deposition (DED-Arc) facility, incorporating the M1 Metal AM System. The scope of the qualification included assessment of control relating to feedstock, equipment, personnel, processes, and build control covering multiple materials, like aluminum alloys, copper alloys, carbon, and stainless steel alloys. Moreover, MX3D can now print materials using processes qualified by Lloyd's Register and issue 3.1 or 3.2 material certificates (3.2 certificates require third-party inspection), which enables the printed parts to be certified.

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