

Turkish Additive Manufacturing Association (TAMA)

Turkish Additive Manufacturing Association is a non-governmental entity established in 2018 and officially registered as an association in 2023. It promotes and disseminates Additive Manufacturing technologies in Türkiye. TAMA is managed by academics, researchers and professionals who are experts in Additive Manufacturing and related technologies. TAMA also aims to organise international conferences, events, online webinars, student activities and professional training.



Fig. 7 Turkish AM cluster successfully attracted numerous participants to the association's conference in Antalya, Türkiye, in April 2024 (Courtesy TAMA)

MetalWorm

MetalWorm specialises in robotic wire-arc DED. Its holistic approach to problem solving includes advanced toolpath strategies, real-time process monitoring, adaptive process control, materials science, and a process parameter library suitable for different materials and geometries. As part of this all-encompassing strategy, MetalWorm manufactures robotic Additive Manufacturing machines that are suitable for various levels of research as well as industrial production.

Norm Additive & Norm 3D

Founded in 2021 under the umbrella of Norm Holding, Norm Additive continues to serve and enhance capabilities across various sectors beyond the parent company's automotive industry, including aerospace, white goods, machinery and automation, and medical. Located in Izmir, Norm Additive's 750 m² facility utilises PBF-LB technology.

The company's production and engineering equipment includes GE Additive M2 S5 and EOS M290-1 kW metal AM machines. Norm Additive offers a wide range of materials, including metal alloys such as AlSi10Mg, 316L stainless, EOS's CuCp copper and MS1 maraging steel, furthermore it has an ever-expanding



Fig. 8 The MetalWorm robotic wire-arc Directed Energy Deposition machine is designed to enhance efficiency and flexibility in metal manufacturing. With low buy-to-fly ratios, these machines minimise waste by precisely depositing material only where needed, enabling the efficient use of high-value metals (Courtesy MetalWorm)



Fig. 9 Norm Additive's organisational structure highlights its comprehensive range of services and expertise in Additive Manufacturing (Courtesy Norm Additive)

“In addition to Norm Additive, Norm 3D was established in 2024 to meet the needs of customers in Türkiye who wish to acquire Additive Manufacturing technology. The company partners with EOS GmbH and is its sole official distributor in Türkiye.”

materials portfolio. Post-processing services such as heat treatment, surface polishing and cleaning, machining, sandblasting, and surface coating are provided in-house. Its extensive workshop and technical capabilities – including assembly, integration, and fastening component installation processes – enable the

production of fully finished parts.

In addition to manufacturing services, various engineering studies are conducted on customers' existing products and parts to enable sustainable and lightweight product manufacturing. Norm Additive also offers reverse engineering services through its 3D scanning and CMM

capability. With a newly established quality control department, opened this year, parts undergo quality inspections and are then delivered to customers with detailed reports.

In addition to Norm Additive, Norm 3D was established in 2024 to meet the needs of customers in Türkiye who wish to acquire Additive Manufacturing technology. The company partners with EOS GmbH and is its sole official distributor in Türkiye. Norm 3D is responsible for offering suitable machine options to customers looking to purchase AM machines, managing the sales process, and providing all maintenance and repair services after the sale. In addition, it supplies raw materials and spare parts to its clients. The company is headquartered in Izmir, with offices in Istanbul.

Alloy Additive

Conventional welding experience is highly valuable in Additive Manufacturing. This expertise is especially important in relation to DED based technologies. As a result of prioritisation efforts, it is essential for Türkiye to develop its own AM machine production capability, to establish its own production parameters, and utilise locally-sourced raw materials.

Since its foundation in 2020, Alloy Additive has been pushing the limits of what DED technology can achieve. The company's approach utilises a Tungsten Inert Gas (TIG) welding robot to achieve industry-leading deposition rates, enabling the rapid manufacturing of large parts using a wide range of materials, including titanium alloys, Invar, Inconel, and stainless steels.

Alloy Additive's core innovation lies in its proprietary software, which enables precise control over DED process parameters. This enables manufacturing with 95% less material waste compared to conventional methods. This efficiency not only saves costs but also reduces CO₂ emissions by 90%, making the approach equally attractive for its sustainability.