

Dr Filomeno Martina – CEO and co-founder

17th October 2024











TYPHOON

Eurofighter rear frame

"From 100 weeks to 100 days"

• World's **largest** 3D printed titanium part

 Winner of **3Dprintingindustry.com award** for automotive / aerospace application of the year in 2019

Courtesy Cranfield University

What about even bigger parts?



Description of the project

Scope:

- 1. Industrialise novel WAAM[®] hardware enabling the **highest deposition rate** on the market (suitable for several materials)
- 2. Provide a versatile and adaptable WAAM production tool that could be used to **upgrade** existing systems with the LAMM's capability

Starting points:

- 1. FoF LASIMM project
- 2. WAAM3D internal developments

Team



WAAM3D (SME, UK) Guaranteed (SME, BE) FAN3D (SME, PT) LMS (Uni, GR)

Description of the project

Project goals:

- 1. Industrialise and test the highest deposition rate WAAM[®] kit on the market for Ti64 and Steel more than 100% increase in speed
- 2. Further reduce cost and CO₂ emissions of WAAM-produced parts as-measured by in-house developed Life Cycle Assessment models
- 3. Develop software tools to optimize path planning and process control
- 4. Lower entry barrier towards AM for SMEs by offering an **adaptive** system that can be **retrofitted**
- 5. Educate engineers and SMEs on the WAAM technology





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Demonstration



Project deliverables

Hardware

End-effectors for high-deposition rate PTA & CWMIG built & sensors integrated

Software

Path planning and control/monitoring software Life Cycle Assessment

Test & Transfer

WAAM3D: HW testing, demonstrator parts building End users: HW integration, demonstrator parts building





Exploitable results

Two marketable outcomes

- 1. PTA EE, focusing on Ti alloys
- 2. CWMIG EE, focusing on steel, aluminum and nickel-based alloys (supported by bespoke, state-of-the-art software)

USPs

- ✓ Specifically engineered for AM rather adapted from welding ✓ Significantly increased deposition rates
- ✓ Integrated sensors for on-line process monitoring and accurate process control
- \checkmark Versatile solution that can be retrofitted also on existing machines
- ✓ Lowered barriers to entrance to AM especially for SMEs

Life Cycle Assessment

Life Cycle Assessment

Commercialisation

Market possibilities and potential

- At the moment the AM industry is valued at \$40b
- WAAM is a fast-growing sector, expected to reach 3500 units sold between 2025-2030
- The LAMM products will dramatically increase the total addressable market by: ✓ Enabling the manufacture of more massive components in much shorter time
 - \checkmark Reducing the cost of printing thanks to the higher productivity

Innovate Together

Why did you decide to continue with Innovate Together in EITM?

- After three years since the completion of LASIMM + substantial R&D work (ca. €3m of internal investment) we wanted to focus our efforts on "the icing on the cake" – the final industrialisation of novel solutions for high-productivity
- Design and test hardware sub-elements (the End Effectors) that could be provided as their-own independent products, expanding WAAM3D's market potential

How did Innovate Together help to evolve your FoF result(s)?

- **Prioritise** and **fund** industrialisation activities of strategic importance to further develop the FoF project outcomes
- Create value and increase competitive advantage with the support of the consortium partners

Unique customers

47

Cumulative revenues since 2020

Countries with our kit

Trophy cabinet

AEROSPACE TECHNOLOGY INSTITUTE

Aerospace Technology Institute Breakthrough Award 2023

Company with the most potential to impact aerospace and to support the journey to net zero 2050 for commercial flight

Thank you

Dr Filomeno Martina filo@waamd.com

eitmanufacturing.eu

