

PROJECT

## ASSALA

# Advanced Simulation Solutions Applied to Quality Control of Laser Deposited Metals

**Funding:** European (Horizon 2020)

**Duration:** Apr 2019 - Sep 2021

**Status:** Complete

**Total project cost:** €599,931

**EU contribution:** €599,931



**Call for proposal:** H2020-CS2-CFP08-2018-01

[CORDIS RCN : 221222](#)

### Objectives:

The main objective of the ASSALA project is to develop a methodology to predict defect generation likelihood induced by the interaction of robot inaccuracies and thermal effects during the Laser Wire Deposition (LWD) process of Titanium integrating deterministic and advanced statistical models applied on the manufacturing of new generation aero engine structures. The novel activities to carry out during the project will be based on:

- The development of a tool focused on the automatic path generation applied on to robotic LWD based on 5 degree of freedom deposition.
- A dynamic robot model to compensate and estimate through Monte Carlo simulation the temporal positioning accuracy.
- A fast and precise computation algorithm that will allow to solve the time consuming dynamic thermo-mechanical phenomena of the solidification process based on Finite Element Modelling through model order reduction strategies.
- Implementation of process monitoring (thermal and visible) and control tools (CAM correction) for the implementation of adaptive control strategies which will correct the component distortion.
- Integration of the developed algorithms in a methodology to predict the failure probability based on Monte Carlo statistical tools.
- Testing and validation of the developed simulation tools and implemented adaptive control strategies.

ASSALA aims at contributing to achieve more efficient and robust LWD processes provided that the end effector-to-component relative distance plays a major role in the stability of the process and in the generation of defects such as cracks or flaws that can induce the rejection of the deposits due to the critical structural nature of the aero engine components.

### Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

**Institute type:** Public institution

**Institute name:** European Commission

**Funding type:** Public (EU)

**Other programmes:** JTI-CS2-2018-CfP08-ENG-03-23 Probabilistic simulation of defect probability in LWD - Wire fusion processes

### Lead Organisation:

**Fundacion Tekniker**

**Address:**

Avenida Otaola 20  
20600 Eibar Guipuzcoa

Spain

**Organisation Website:**

<http://www.tekniker.es>

**EU Contribution:** €331,931

**Partner Organisations:**

**Ecole Nationale Supérieure D'arts Et Metiers**

**Address:**

BOULEVARD DE L HOPITAL 151

75013 PARIS

France

**Organisation Website:**

<http://www.ensam.eu>

**EU Contribution:** €268,000

**Technologies:**

Additive manufacturing

Laser Metal Deposition

(LMD)

**Development phase:** Research/Invention

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Air transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Other specified

**Geo-spatial type:** Other