Additive manufacturing involving titanium and aluminium alloys

FATAL project

The project concerns the development and comparison of two metal additive manufacturing processes: laser projection (or Direct Metal Deposition - DMD) and laser powder bed fusion (or Selective Laser Melting - SLM) for the production of parts for the aerospace, automotive and energy industries.

Technical and economic impacts

- Optimisation of performance of parts
- Reduced manufacturing times
- Reduce manufacturing costs

Keywords

Laser projection // Laser powder bed fusion
Aluminium alloy // Titanium alloy
Steel // Data base

Production of test parts using laser projection
july 2015

Production of test parts using laser powder bed fusion
october 2016

Completion of the DMD and SLM database
february 2018

april 2015
Kick-off Meeting

september 2016
Production of parts using laser projection

august 2017
Production of test parts using laser powder bed fusion

march 2018
End of the project

INDUSTRIAL CONTEXT

In an industrial context in which maintaining competitiveness remains a key goal, additive manufacturing technologies appear essential and are often presented as an authentic industrial revolution, based on innovative technologies, and which completely calls into question conventional manufacturing methods. However, many questions remain concerning the true capacity of these new technologies and how they can actually be harnessed to drive growth.

INNOVATIVES FEATURES

- **Development of processes:** improved understanding of the impact of processes on material characteristics for both laser projection and laser powder bed fusion.
- **Evaluation of the performance of parts:** characterisation of the impact of these processes on the behaviour of parts under stress.
- **Innovative design:** Development of bricks in the DFAM (Design For Additive Manufacturing) methodology and topological optimisation.
- **Certification:** methodology of parts certification (aerospace industry).

INDUSTRIAL APPLICATIONS

The results obtained will provide manufacturers with data enabling them to assess the contribution made by these new technologies, while favouring their utilisation by engineering offices, thus leading to innovative design.

Partners

- IRT JULES VERNE
- DAHER
- EUROPE TECHNOLOGIES
- FIVES
- LOIRETECH
- RENAULT
- ARTS ET METIERS ANGERS (LAMPA)
- UNIVERSITE DE NANTES (GeM ET IMN)
- CENTRALE NANTES (IRCCyN)

Equipment

- Laser powder bed fusion equipment

Budget

- 2 197 k€

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