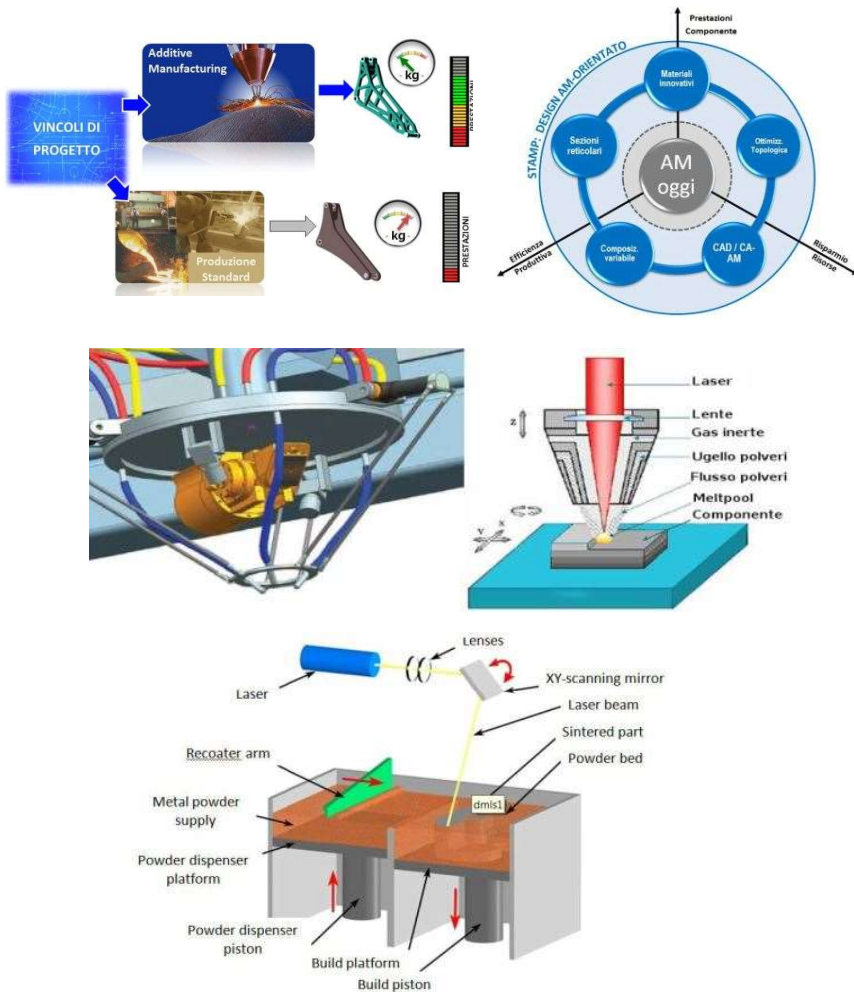


TECHNOLOGICAL DEVELOPMENT OF ADDITIVE MANUFACTURING IN PIEDMONT



Currently the industrial scenario is going through that which is defined as the Fourth Industrial Revolution, characterized by a strong digitalization of all the productive process. In this panorama the Additive Manufacturing (AM) technologies cover a fundamental role. The level of reliability of these processes however, as the overall maturity of the industrial substrate for receiving and using them, is still insufficient.

STAMP therefore wants to overcome these difficulties proposing an integrated solution of machine, process, software and management control that could reinforce the use of the AM technology incrementing its penetration in the productive reality of Piedmont. STAMP not only will build machines (both Powder Bed and Direct Deposition) more efficiently compared with the ones currently on the market, but will provide guide-lines to design using AM. In this way it will be possible to overcome the approach used nowadays with a more efficient developed for an industrial production. The project is funded by Italy, Piedmont Region and European Union.

THE CONSORTIUM



TECHNOLOGICAL DEVELOPMENT OF ADDITIVE MANUFACTURING IN PIEDMONT



STAMP



INTRODUCTION

Nowadays the industrial scenario is going through that which is defined as the Fourth Industrial Revolution, characterized by a strong digitalization of all the productive process. In this panorama the Additive Manufacturing (AM) technologies cover a fundamental role. The level of reliability of these processes however, as the overall maturity of the industrial substrate for receiving and using them, is still insufficient. STAMP therefore wants to overcome these difficulties proposing an integrated solution of machine, process, software and management control that could reinforce the use of the AM technology incrementing its penetration in the productive reality of Piedmont. STAMP not only will build machines (both Powder Bed and Direct Deposition) more efficient compared with the ones currently on the market, but will provide guide-lines to design using AM. In this way it will be possible to overcome the approach used nowadays with a more efficient developed for an industrial production. The project is funded by Italy, Piedmont Region and European Union.

STAMP OBJECTIVES

- Characterization of new materials for AM applications, both SLM and EBM
- Creation of guide lines for the post-processing of pieces created with AM technologies in order to pass from an handmade approach «trial&error» to a more efficient and reliable for industrial applications
- Use of softwares developed for the AM technologies
- Preparation of trained personnel able to understand the trials of a piece realized in Additive Manufacturing
- Development of a multi level line check in real time and close loop in order to better control the growth of the piece in the machine and reduce the scrap to a level near to zero
- Creation of a new Powder Bed machine with improved features (greater work zone for bigger parts, innovative deposition strategy) in order to increase the actual state of art of this technology
- Creation of a new Direct Deposition machine with improved features (greater work zone for bigger parts, double movement structure) in order to increase the actual state of art of this technology

EXCELLENCE

CONCEPT AND APPROACH

The general purpose of the STAMP project is to consolidate and develop further the actual level of the process and of the quality standards for the production of metal parts in Additive Manufacturing

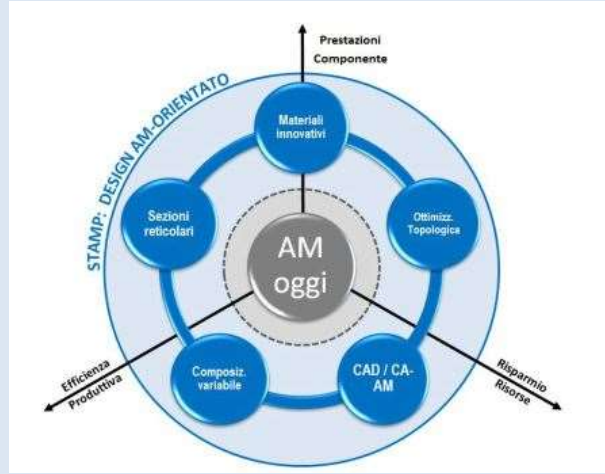
OVERVIEW OF THE WORKPLAN

- The overall activity has been organized in 9 Work Packages hereinafter reported:
- WP0 : Management (Leader PRIMA)
 - WP1 : Definition Business case (Leader GE Avio)
 - WP2 : Redesign and building of parts (Leader IIT)
 - WP3 : Development DD technology (Leader PRIMA)
 - WP4 : Development PB technology (Leader PE)
 - WP5: ICT to support AM (Leader PE)
 - WP6 : Characterization materials (Leader POLITO DISAT)
 - WP7 : Standardization (Leader AVIOSPACE)
 - WP8 : Dissemination and exploitation (Leader UNITO)

EXPECTED RESULTS

Hereinafter are summarized the expected final TRLs for each line of research

- a) Design AM-oriented
- Use of powder metal alloy in the AM production → TRL5
 - Development of innovative materials → TRL4
 - Guide lines of the heat treatments for parts realized in AM → TRL 5
 - Guide lines of surface finishing treatments for parts realized in AM → TRL 4
 - Guide lines for topology optimization → TRL 5
- b) Development of deposition technologies
- Prototyping of DD machine → TRL 6
 - Validation of DD prototype → TRL5
 - Prototyping of PB machine → TRL 6
 - Validation of PB prototype → TRL5



CONSORTIUM

The STAMP Consortium, counting 25 partners, is wide and gathers simultaneously Big Companies such as FCA or Avio Aero, SME such as APR or Ellena and Universities such as Polito and Unito. This heterogeneity allows the Consortium to count on different know-hows that embrace various fields, peculiarity that well suits with this all-inclusive project



PARTNERS	ACTIVITY
PRIMA INDUSTRIE S.p.A.	Project Leader, DD machine development
Consoft S.p.A.	IT architecture
PRIMA Electro S.p.A.	ICT Leader
GE Avio S.r.l.	Case study supplier
Thales Alenia Space	Case study supplier
FCA	Case study supplier
Politecnico di Torino DISAT	Innovative material development
Politecnico di Torino DIGEP	Supervisor analysis business cases
Politecnico di Torino DAUIN	Sensor integration
Politecnico di Torino DIMEAS	Topology optimization
Politecnico di Torino DET	Laser study
IIT	Redesign Leader
Università degli Studi di Torino	Dissemination-Exploitation Leader, Material study
APR S.r.l.	Redesign and production
3D New Technologies S.r.l.	Machine builder
Blue Engineering S.r.l.	DD machine's optimization
IRIS S.r.l.	Material and process selection
ELLENA S.p.A.	Redesign and optimization case study
ITACAe S.r.l.	CAD-CAE-CAM support
Samec S.r.l.	Robotics implementation
Cabelectra S.r.l.	Innovative electro-mechanics implementation
Laserlam S.r.l.	Deposition processes study and analysis
Tosca S.r.l.	Case study supplier
Power Equipments S.r.l.	Cooling system study
S.I. ENGINEERING S.r.l.	SW development
S.R.S Engineering Design S.r.l.	Verification and evaluation standard ESA
Comutensili S.r.l.	Techno-scientific support in innovative processes
Aviospace S.r.l.	Standardization and quality assurance
ALFA MECCANICA S.r.l.	ESA standard verification and requirement study
AISICO S.r.l.	SW for Non Destructive Inspection