

여러분입

MANUFACTURING THE FUTURE







OVERVIEW OF IRT JULES VERNE'S OFFER

3 KINDS OF TECHNOLOGICAL RESEARCH

- R&T collaborative project
- R&T European project
- R&T Contract research



2 KINDS OF TECHNOLOGY TRANSFER

- Sale of patents and licences
- Pre-industrialisation project



MISSION

Focus on Manufacturing

OUR VOCATION To reinforce the competitiveness of the French industry



OUR MISSION To accelerate innovation and promote technology transfer to the factories

> OUR CORE BUSINESS Collaborative research

163M€ from the Programme of Investments for the Future





STRATEGIC POSITIONING ON MANUFACTURING



18/09/2020



R&D THEMATICS

	FORMING AND PREFORMING PROCESSES	 Composites preforming & forming technologies Metal forming
(})	ASSEMBLY	 Multimaterial joining technologies Structure and systems assembly
\bigcirc	ADDITIVE MANUFACTURING PROCESSES	 High deposition rate metal additive manufacturing High performance composites additive manufacturing
	MOBILITY IN INDUSTRIAL ENVIRONMENT	• Smart and autonomous mobility of manufacturing tools and systems in industrial environments or structures
<u> </u>	MANUFACTURING FLEXIBILITY	 Flexible and intelligent process automation Quick reconfigurability of manufacturing systems



NATIONAL INTER-IRT PROGRAMS



Thermoplastics

	Materials	Semi-product	Processes	Assembly
St-Exupéry	x	X		
Jules Verne		X	x	x
M2P	X			

Additive Manufacturing

	Design	Raw material	Materials	Processes	Post-treatment	
St-Exupéry			X			
Jules Verne				X		
M2P		x			Х	
SystemX	X					
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SERVICES

TECHNOLOGY TRANSFER PROCESS







INDUSTRIAL NEEDS

INDUSTRIAL RESEARCH PROJECT

- Involvement of integrators
- Integration of use cases in the project
- Techno economic assessment

TRANSFER TO THE FACTORY

TECHNOLOGY MATURATION

Exploitt Method inspired ©





MAJOR INDUSTRIAL MEMBERS





PARTNERSHIPS



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UNIVERSITIES & RESEARCH CENTRES





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SMEs AT THE HEART OF IRT JULES VERNE

A strong and historic bond with

The European manufacturing technology competitiveness cluster











THE PLACE OF ACADEMIC PARTNERS AT IRT JULES VERNE



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KEY FIGURES (SINCE 2012)

PROJECT PORTFOLIO

99 R&D Projects

182 M€

EUROPEAN

10 EU Projects

Almost **4**. M€

STRONGER TOGETHER

135 + Employees

51 Industrial Members

12 SME Members

16 Academic Members

REVENUE & ASSETS 26,5 M€ Annual Revenue 17 M€ +

Equipment Investments

Patents

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JULES VERNE INSTITUTE EXECUTIVE BOARD



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AT THE HEART OF A MAJOR INNOVATIVE CAMPUS



TECHNOCAMPUS COMPOSITES 20 000 m²



TECHNOCAMPUS OCEAN 20 000 m²



IRT Jules VERNE – 2 500 m²

- Composite Processes
- Modelling and Simulation
- Characterisation, Control and Monitoring



IRT Jules VERNE – 1 500 m² • Metal Additive Manufacturing

Robotics and Cobotics

> 7000 Employments / 700 Researchers / 1000 Students (2020)



15000 Employments / 1500 Researchers / 3000 Students





SOME OF OUR R&D PROJECTS

NEW HIGH-SPEED COMPOSITE PROCESS WING PROJECT

OBJECTIVES

- To evaluate the ability of textile technologies to meet high production rates of the aeronautics industry for large scale parts and complex geometry.
- Research activities include : preform architecture, tooling concepts and automated textile layup line.

INDUSTRIAL IMPACTS

- High deposition rate through thermo-set technology
- Minimal material waste
- Investments reduction

PARTNERS

IRT Jules Verne, Airbus, Fives, Loiretech



WING PROJECT





CONTINUOUS INDUCTION WELDING FOR THERMOPLASTIC FUSELAGE SIDEFFECT PROJECT



- To develop and evaluate dynamic induction welding for thermoplastic fuselage in a low cost and high speed context.
- The final demonstrator integrates the geometric complexities representative of a fuselage panel.

INDUSTRIAL IMPACTS

- Increase in the production rates of thermoplastic structures
- Reduction in the cost price of composite stiffened panels
- Optimisation of the design and mass reduction of stiffened structures

PARTNERS

IRT Jules Verne, Airbus Operations, Aviacomp, Cetim, Europe Technologies, Hutchinson, Latécoère, Stelia Aerospace, Ireena (Univ Nantes), LTEN (Univ Nantes)



SIDEFFECT PROJECT

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HANDLING & POSITIONING OF HEAVY PARTS FOR ASSEMBLY



- To develop and evaluate an aerostructure assembly line concept which is flexible regarding product variant and production rate evolution.
- The system consists in positioners mounted on Automated Guided Vehicles and controlled by a closed loop system based on local measurements provided by external sensors.

INDUSTRIAL IMPACTS

- Flexibility to product variant and production rates
- Non recurring cost reduction
- Enhanced reconfigurability of the workshop

PARTNERS

IRT Jules Verne, Airbus, Acsystème, CNRS (LS2N), IMT Atlantique, INRIA



HAPPY PROJECT



ADDITIVE MANUFACTURING OF COMPOSITES

FACT PROJECT

OBJECTIVES

 To evaluate two additive manufacturing technologies, laser sintering of powder material (LS) and material extrusion (FFF, FDM), applied to high temperature polymers out of the groups of PAEKs, especially PEEK (for FFF) and PEKK (for LS and FFF) with and without carbon fiber reinforcement.

INDUSTRIAL IMPACTS

- Improvement of mechanical properties
- Improvement of cost-benefit ratio
- Improvement of productivity

PARTNERS

IRT Jules Verne, Airbus, Arkema, Daher, Dedienne, EOS, Liebherr-Aerospace Toulouse, Safran, Zodiac Engineering, Canoe, Université de Nantes (LTN), CNRS (LTN & PIMM), Arts et Métiers (PIMM)





FACT PROJECT

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ADDITIVE MANUFACTURING THROUGH ROBOTIC WELDING OF ENHANCED NETWORK ARWEN PROJECT



 The development of a process for additive manufacturing of INVAR shells comprising slabs assembled through a robotic welding process to produce large moulds for the drape forming of composite materials.

INDUSTRIAL IMPACTS

- Better quality of the finished product
- Optimisation of production cycle
- Reduction of cost production

PARTNERS

IRT Jules Verne, Airbus, Aperam, Dassault Aviation, Loiretech



ARWEN PROJECT



STRUCTURE & HEALTH MONITORING FOR RENEWABLE ENERGY

OBJECTIVES

- To identify the optimal monitoring for assessing the state of health of welded mechanical structures and loosening of bolted connections, e.g. loss of pretension in offshore turbines.
- To better forecast and also detect issues of bolt pretension loosening and weld health (crack detection/evolution).

INDUSTRIAL IMPACTS

- To reduce maintenance operations costs of wind offshore structures
- To develop a SHM solution for metallic offshore structure

PARTNERS

IRT Jules Verne, GE Renewable Energy, IFSTTAR, ESEO (EXPERTISE)



SHORE PROJECT







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