



INTEGRADDE: Pilot lines for Additive Manufacturing of metal components

INNOVATION & MANUFACTURING BROKERAGE EVENT

6th of October 2019

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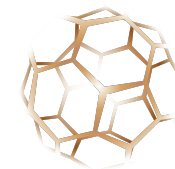


INTEGRADDE: Intelligent data-driven pipeline for the manufacturing of certified metal parts through Direct Energy Deposition processes

DT-FOF-04-2018 – Pilot lines for metal Additive Manufacturing - Flagship INITIATIVE

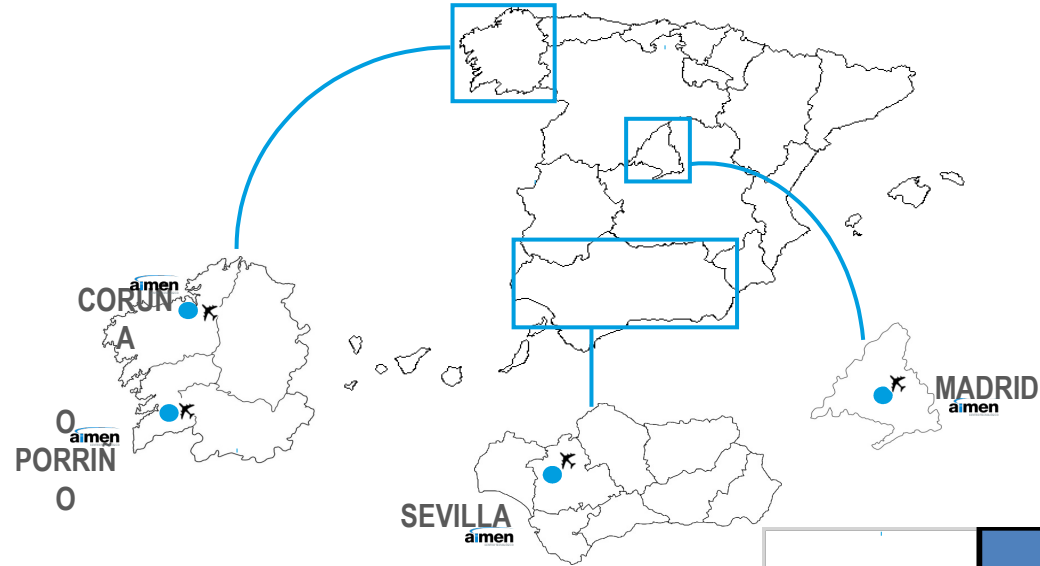
AGENDA:

1. AIMEN PRESENTATION
2. INTEGRADDE IN A NUTSHELL
3. PROJECT OBJECTIVES
4. END USERS
5. OPPORTUNITIES FOR SMEs (OPL NETWORK)

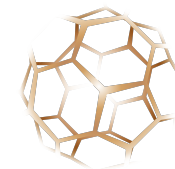


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- Industry supported, private centre
- Applied research in:
 - Additive Manufacturing
 - Advanced Materials
 - Smart Systems and Smart Manufacturing
 - Micro and High Precision Manufacturing
 - Environmental Technologies
- Manufacturing Competence Centre
- Headcount: 250
- Extensive network of industrial partners



PROGRAM	H2020	
	COORD	PA
FoF NMBP SPIRE ICT	6	
	1	



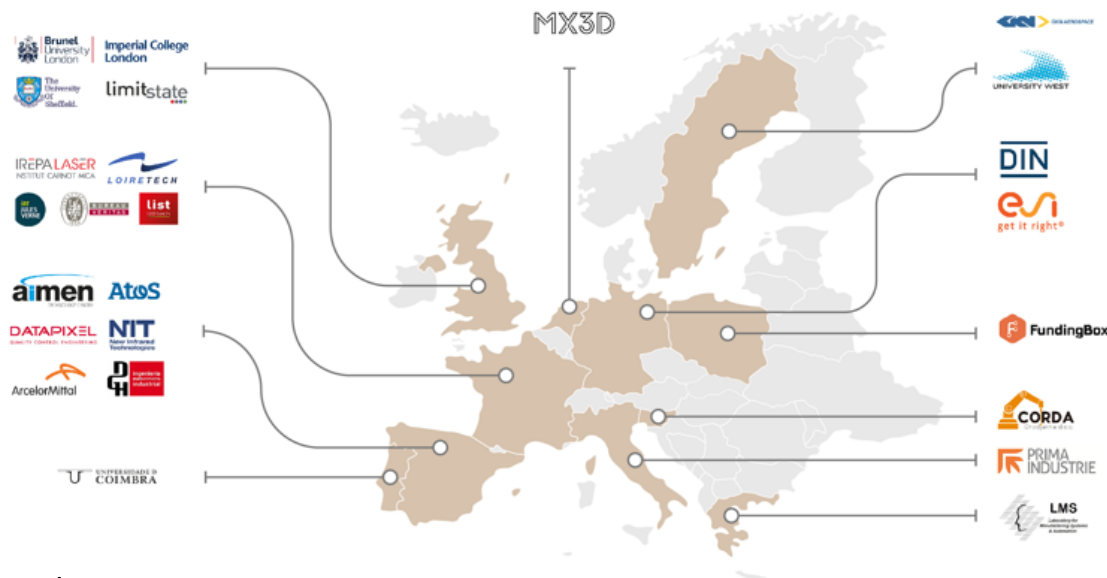
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1. AIMEN PRESENTATION

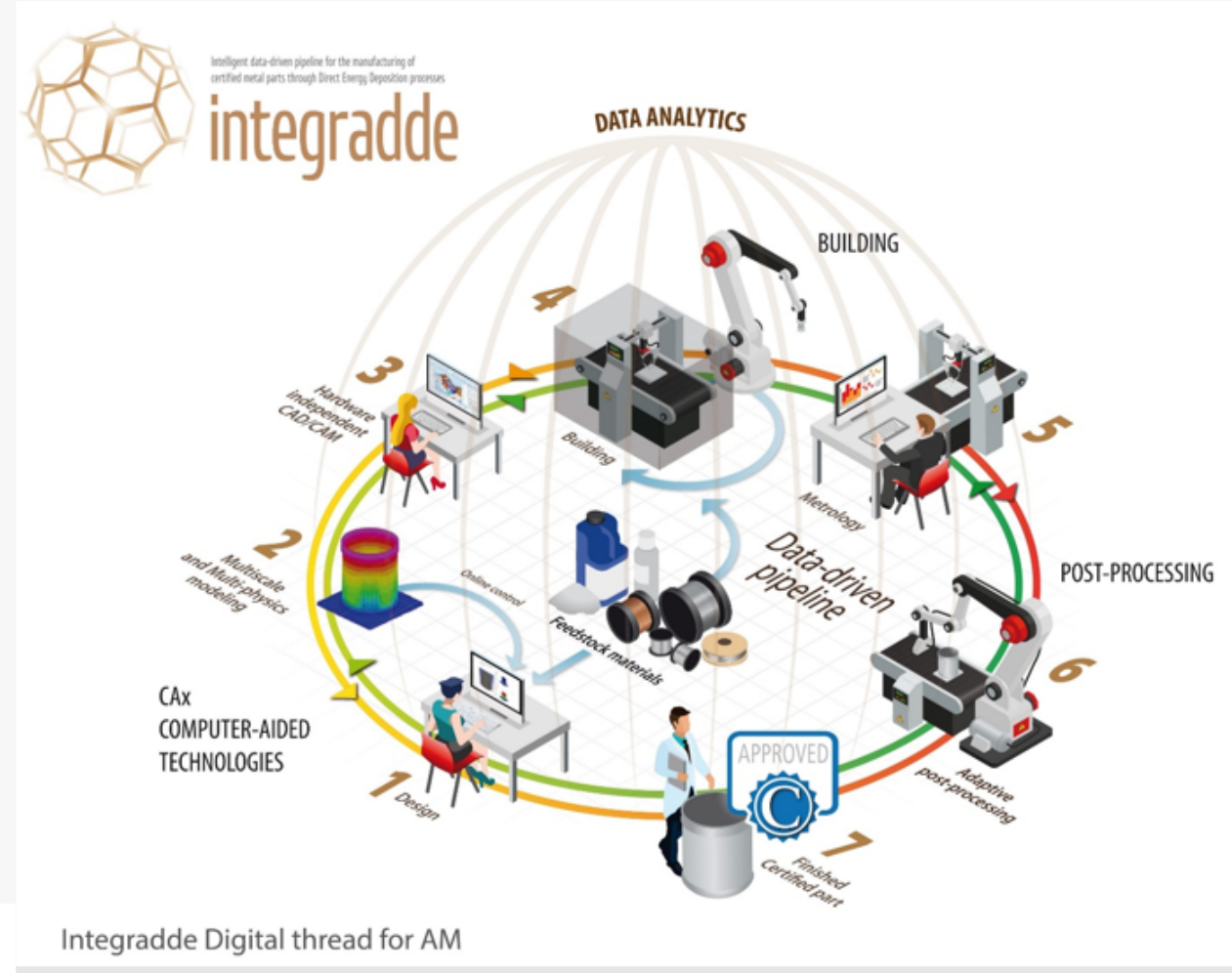
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INTEGRADDE video concept



Holistic perspective consortium:

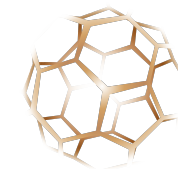
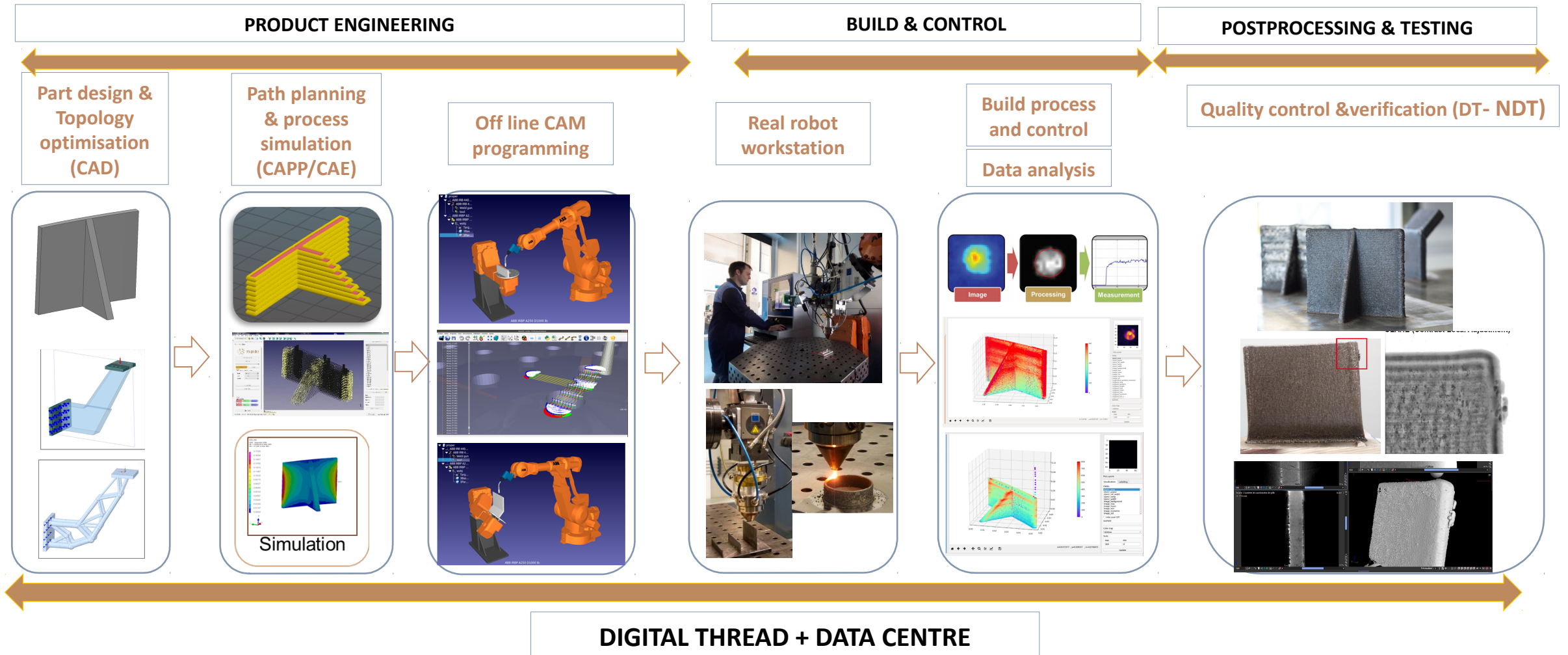
- Laser-based processing
- Robotics
- Control and data analytics



2. INTEGRADDE IN A NUTSHELL



“End to End” dataflow solution on DED-AM: from design to Qcontrol

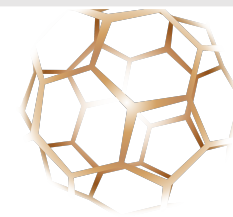


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3. OBJECTIVES



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2. OBJECTIVES

OVERALL: To show the **full potential of metal AM in real manufacturing conditions:**

Right-first time manufacturing of large metal parts. Ensuring the manufacturability of a component from the initial product design.

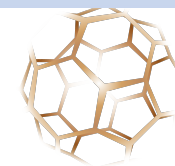
Integration and **interoperability** of AM processes into multistage production systems.

Improve **quality** of AM products. **Unpredictable defects** in final parts are preventing complete deployment and adoption of AM in the metalworking industries.

Certification, regulatory and standardisation.

Novel approaches are required, capable to deal with:

- **Prediction and minimisation of distortion.**
- Intelligent **data-driven pipeline**, enabling **bidirectional dataflow** for a **seamless integration** across the entire value chain.
- **Quality-by-Design** manufacturing strategy.



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2. OBJECTIVES

Manufacturing of medium-/large-sized metal components by **DED technologies**.

Demonstrators:

LMD: Laser Metal Deposition

Engine case made of titanium (LMD-w)

Large parts for the steel industry (LMD-p).

New multimaterial tooling components for the automotive sector (LMD-p).

WAAM: Wire-arc Additive Manufacturing

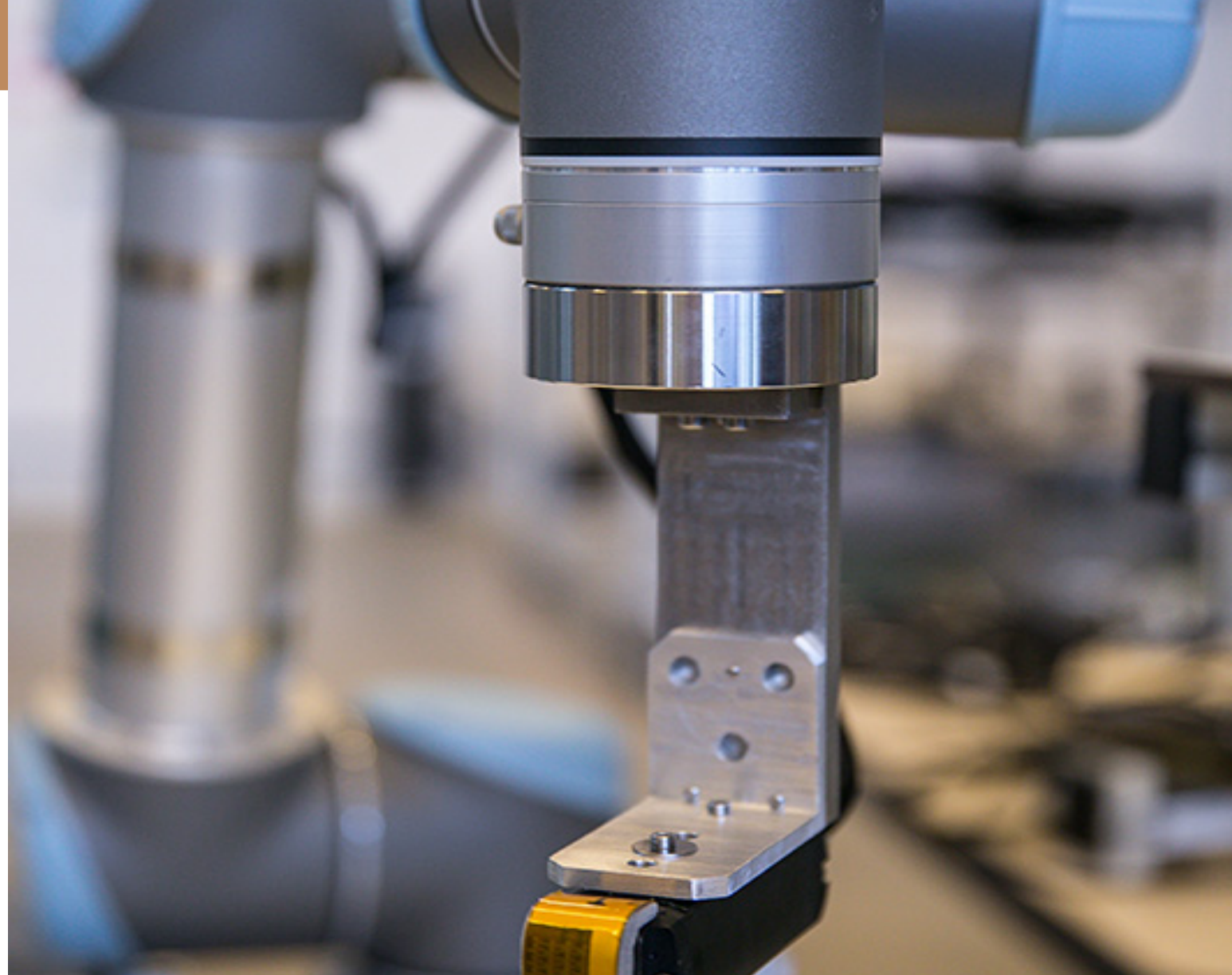
Invar tooling moulds for the aerospace manufacturing sector.

New structural support beams and steel connectors for optimised structures.

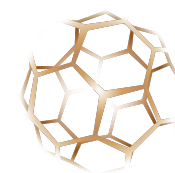
Network of open-pilots, providing **services** and testing facilities for the uptake of AM in EU industry ecosystem (**mainly SMEs and MidCaps**).



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4. END USERS: What sectors are targeted?



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TARGET COMPONENT SCENARIOS – APPLICATION DRIVEN PILOT LINES

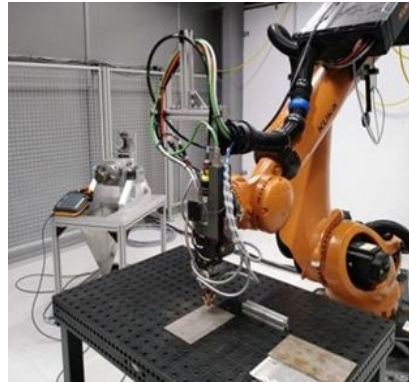
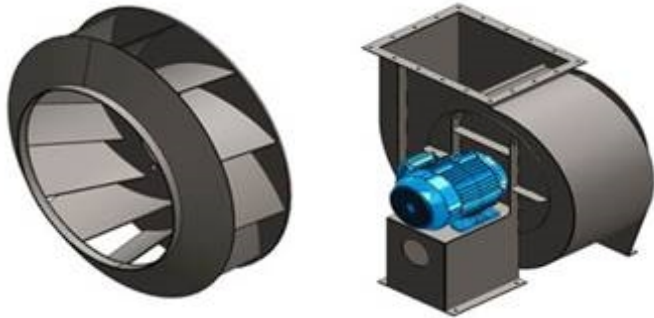


Manufacturing of titanium components for aeronautics by **LMD-w**

Sector: Aeronautics

Target component: Engine case.

Material: Titanium

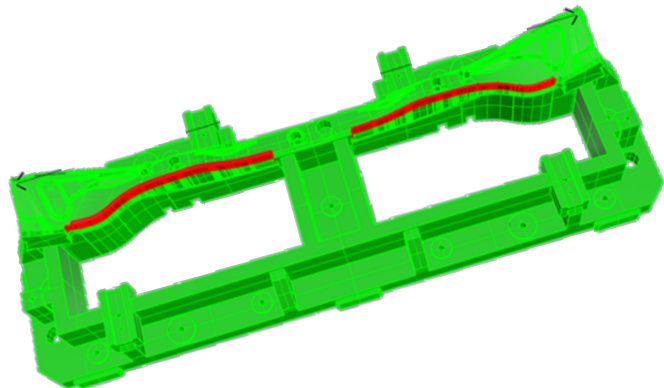


Manufacturing of graded components with a functionalised surface by **LMD-p**

Sector: Steel

Target component: Large parts for steelmaking process.

Material: Carbides in a metal-alloy matrix

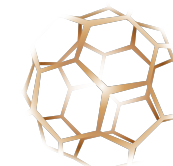


Hybrid manufacturing of tooling by graded materials by **LMD-p**

Sector: Tooling for automotive

Target component: Cutting tools for automotive part manufacturing

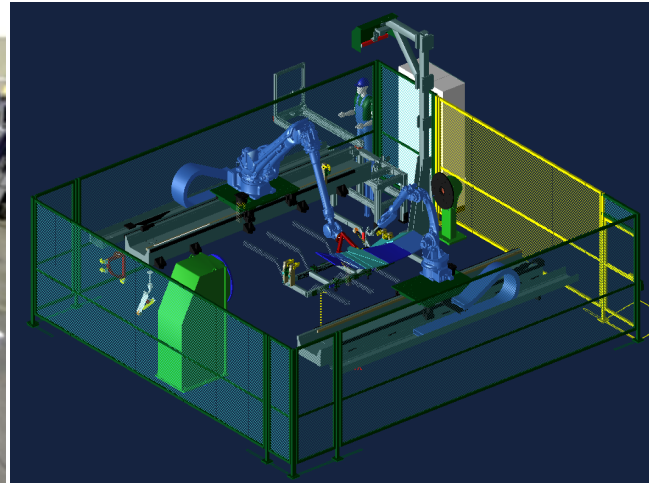
Material: Tool-steel



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TARGET COMPONENT SCENARIOS – APPLICATION DRIVEN PILOT LINES

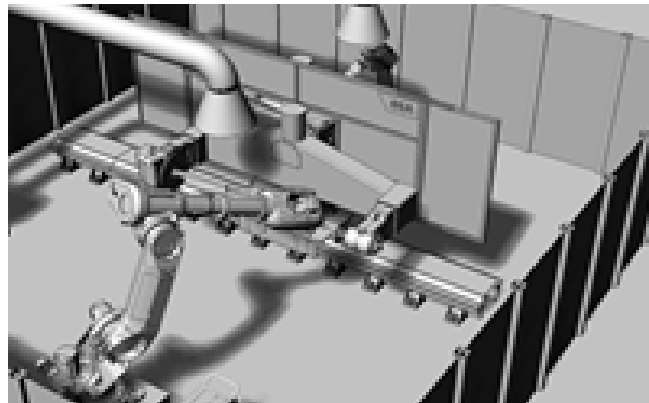
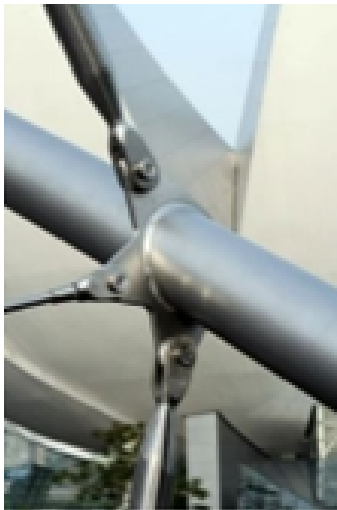


Hybridisation of WAAM with coexisting manufacturing processes (i.e. rolling, folding, welding)

Sector: Tooling for aeronautics

Target component: Panel moulding tooling for aeronautic component by **WAAM**

Material: INVAR

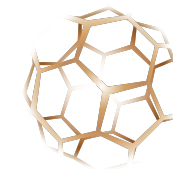


Manufacturing of new structural support beams and steel connectors by **WAAM**

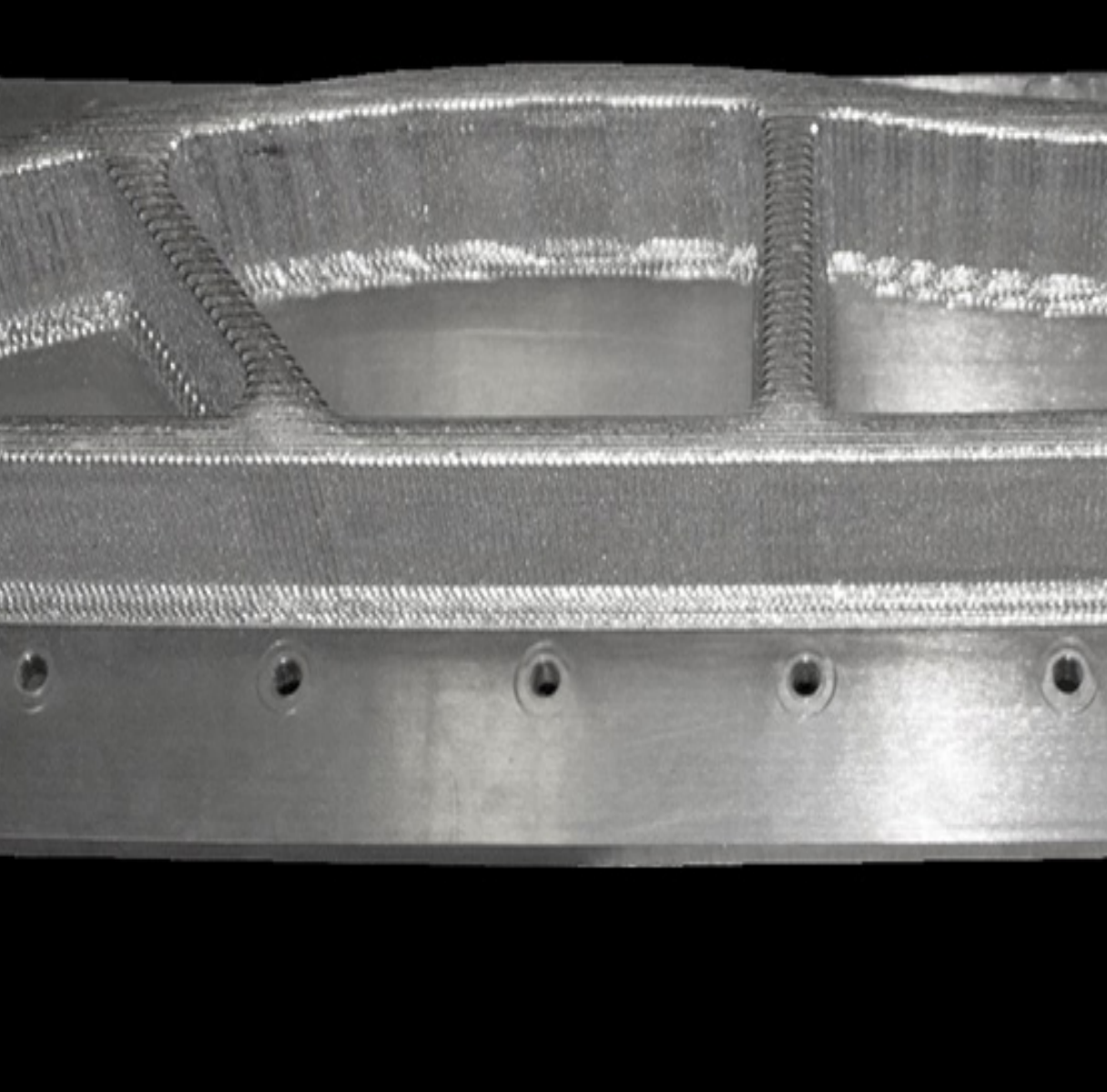
Sector: Construction

Target component: 3D printed steel structural components.

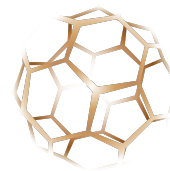
Material: Steel



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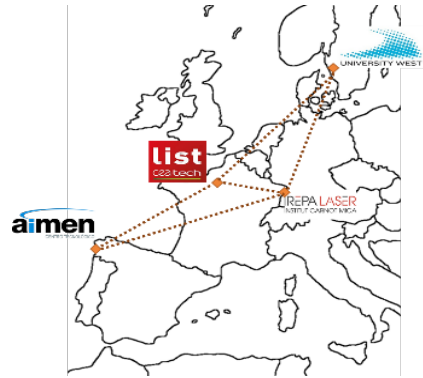


5. How a SME benefits from INTEGRADDE?



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These RTOs infrastructures (**AIMEN**, **WEST**, **CEA** and **IREPA**) have different hardware schemes which ensure interoperability of the developed solution. Each RTO has different and complementary capabilities: http://www.integraddeproject.eu/open_pilot_lines

Capabilities and services will be more accurately defined in the following months in a Catalogue. We are working on access structure for SMEs to led you to the best node that help you: defining the types of services offered , access costs (guidance), consultancy, etc.

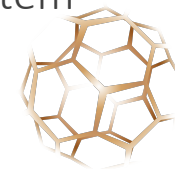


offering services to EU industry of **consultancy** and **proof-of-concept** of DED technologies for the manufacturing of specific metal components.

Supporting the adoption of AM in European Industry.

Demonstrating INTEGRADDE on different **equipment** schemes and AM processes, ensuring interoperability and usability of INTEGRADDE concept in a generic way.

Providing services and testing facilities for the uptake of AM in EU industry ecosystem (mainly **SMEs** and **MidCaps**).



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AIMEN OPEN PILOT LINE in LMD: HARDWARE STATUS AND NEXT STEPS

PROCESSING HEADS + POWDER NOZZLE:

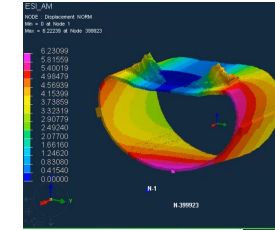
EXISTING BEOD70, Permanova, Coax8

POWDER/WIRE FEEDER.

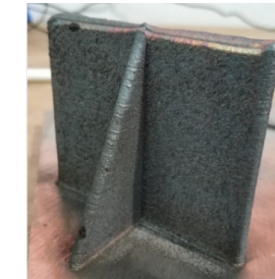
Medicoat, GTV,...

PROCESSING HEADS + POWDER NOZZLE:

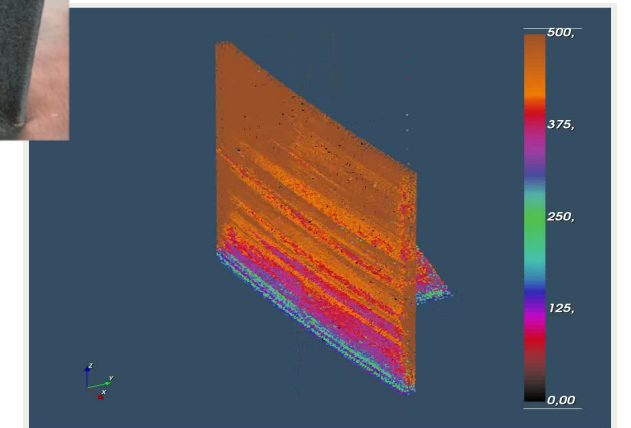
- Trumpf BEOD70 + SO16 (AMIII)
- Precitec LMD-w coaxial (GKN)



Digital Thread in engineering stage



Control and Data gathering during building process



To be defined: In line metrology solution/NDT



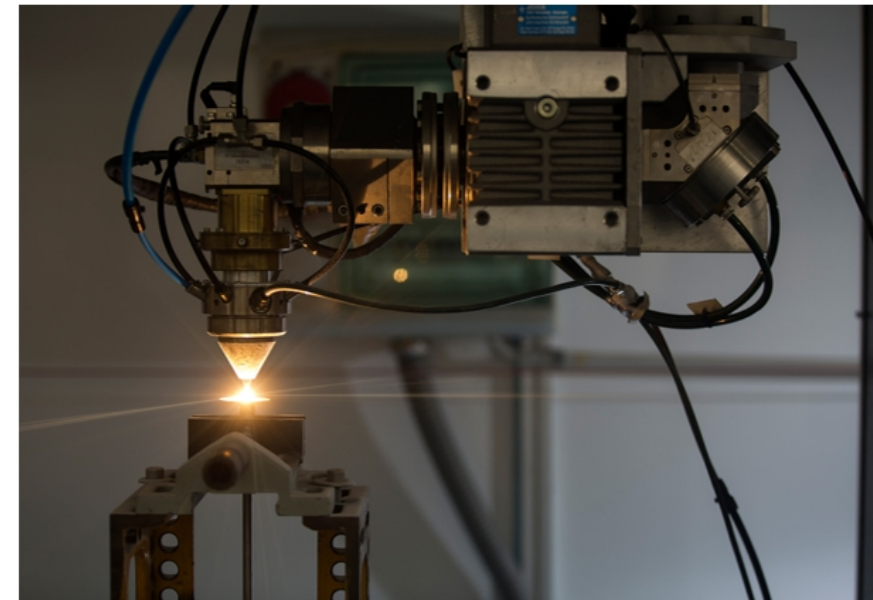
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EXPRESSION OF INTEREST:

During the INTEGRADDE project there is a unique opportunity to be able to access to the network services **at no cost** through an open call (expression of Interest) due to the costs would be covered by the European Commission. Applicant will be requested to submit their EOI through www.fundingbox.com. Until 4 SMEs for free-trials could be selected.

You can start or improve your AM journey!





Sign up in our [newsletter](#) and [RSS](#) channel to get receive all our latest novelties instantaneously. Find here a [INTEGRADDE](#) video concept and [END USER](#) video available on Youtube.



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Thank you for your attention



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