



OPENCALL EVENT

11th February 2021

METAL WIRE ADDITIVE MANUFACTURING (DED-LB-W) CELL

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European
Commission

Horizon 2020
European Union funding
for Research & Innovation

1967 • AIMEN, was established with the aims of promoting **R&D** and providing high-added value **technology services** to the industry.

• **Industry supported, private centre**

2019 • Technological capabilities in:

- Materials research
- Manufacturing Processes
- Laser Processing

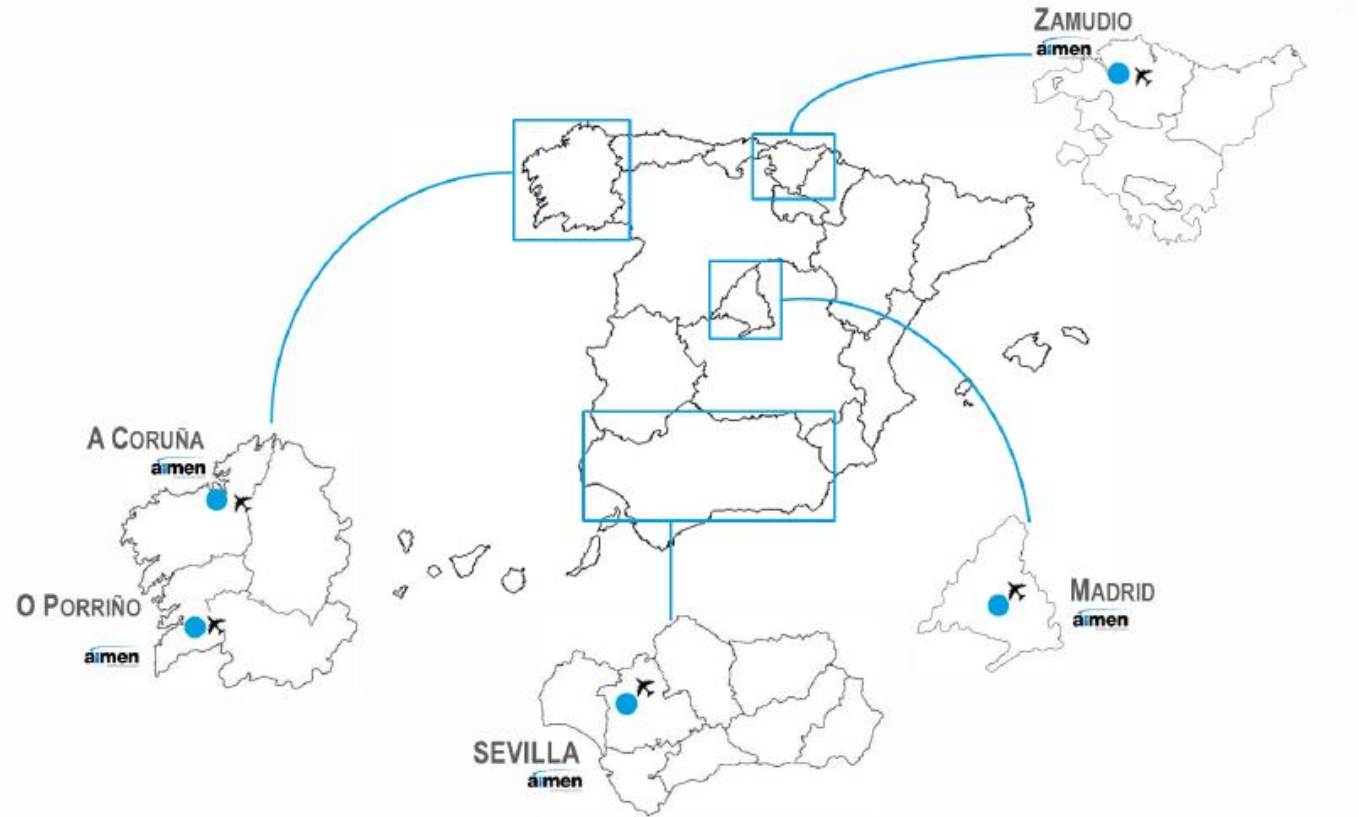
- Multisectorial Centre
- International activities in 20 countries
- Over 750 active customers
- More than **50 R&D projects per year**
- Headcount: **250**
- **18 M€** average annual income
- Over **30 M€** in assets

Testing & Analysis

Industrial Services

R&D&i





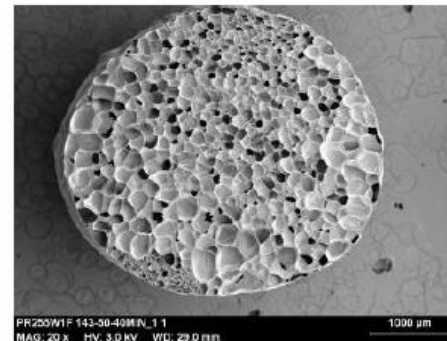
Headquarters and Laser Processing Centre (O Porriño, Galicia)



Offices in A Coruña, Sevilla and Madrid.

Portfolio

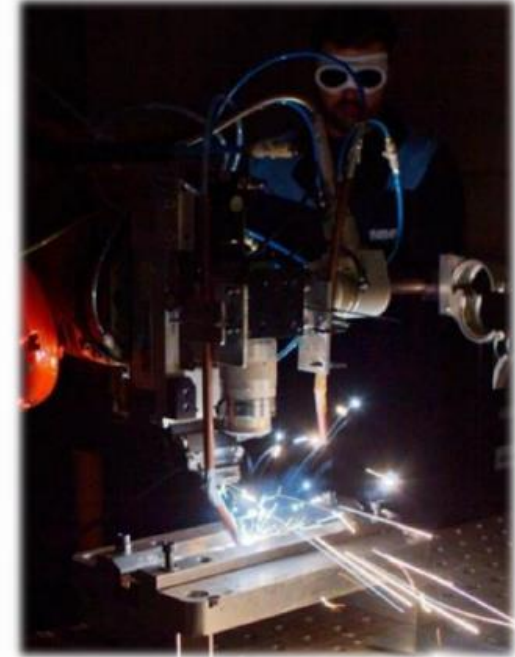
- Advanced Materials
- Smart Systems & Smart Manufacturing
- Laser Based Manufacturing
- Micro and High Precision Manufacturing
- Environmental Technology



PROGRAM	H2020	
	COORD	PARTNER
NMBP-FoF	7	8
NMBP-XX	1	7
NMBP-SPIRE		3
ICT	5	4
SC3-ENERGY		1
SC4-TRANSPORT	2	3
SC5-CLIMATE	1	2
SHIFT2RAIL		3
CLEAN SKY 2	4	3
TOTAL	20	34

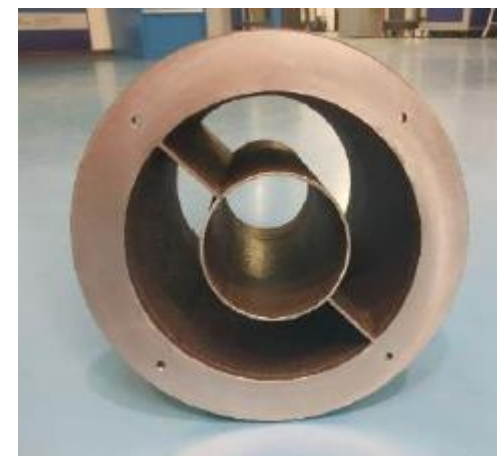
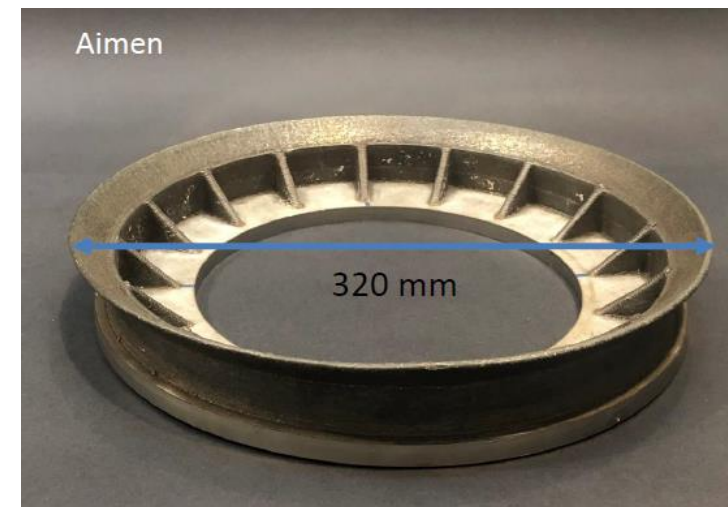
Laser Based Manufacturing

- Additive manufacturing
- Laser assisted processing
- High quality laser production
- High power laser processing





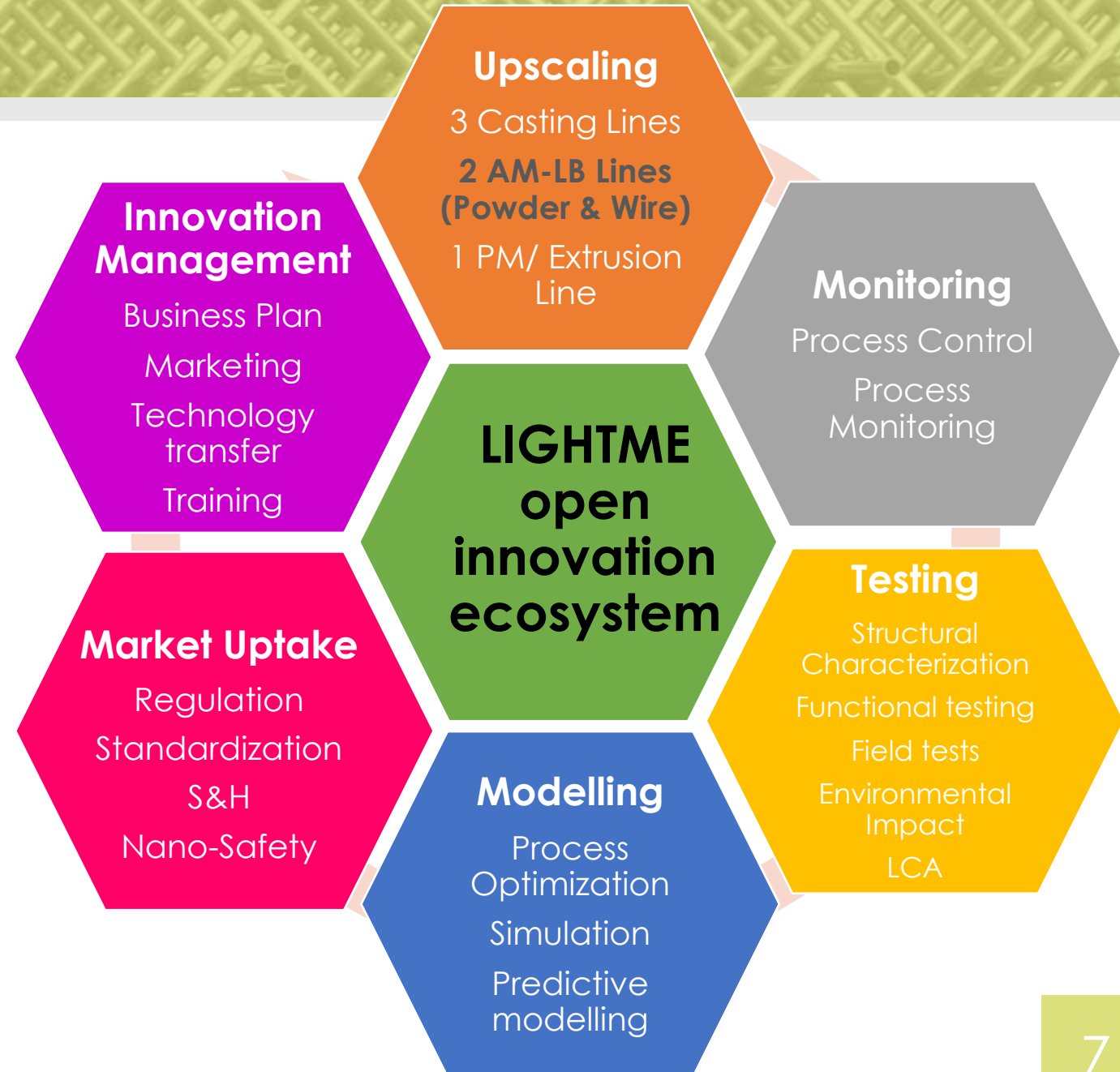
ADDITIVE MANUFACTURING



MWAM Pilot Line

LIGHTME ECOSYSTEM

LightMe project aspires to be a reference for boosting innovation in the field of lightweight metal matrix nanocomposites (MMnC) setting up an Open Innovation Ecosystem (test bed) that will boost the introduction of new functionalities, features and capabilities to lightweight metals.



LIGHTME upgrades

- Setup of a new coaxial wire head
- Controlled temperature build plate
- Inert gas atmosphere system
- Online monitoring
- Optimization process parameters for new materials (MMnC)
- Offline NDT quality control
- Simulation tools



BUILDING BLOCK 1: Pilot Lines Upscaling

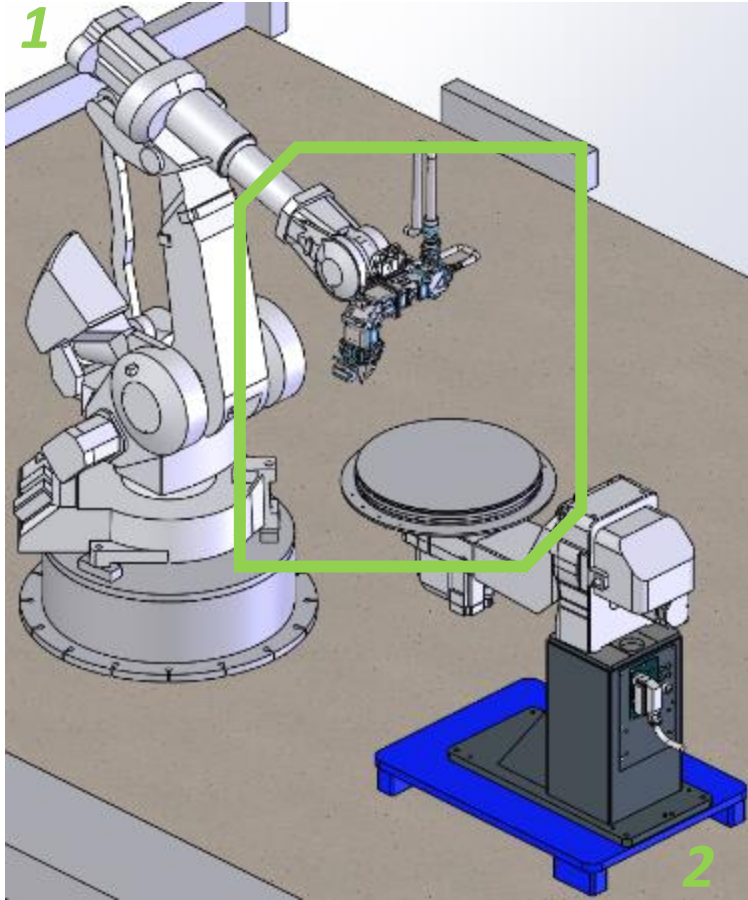


BUILDING BLOCK 2: Monitoring

BUILDING BLOCK 4: Modelling

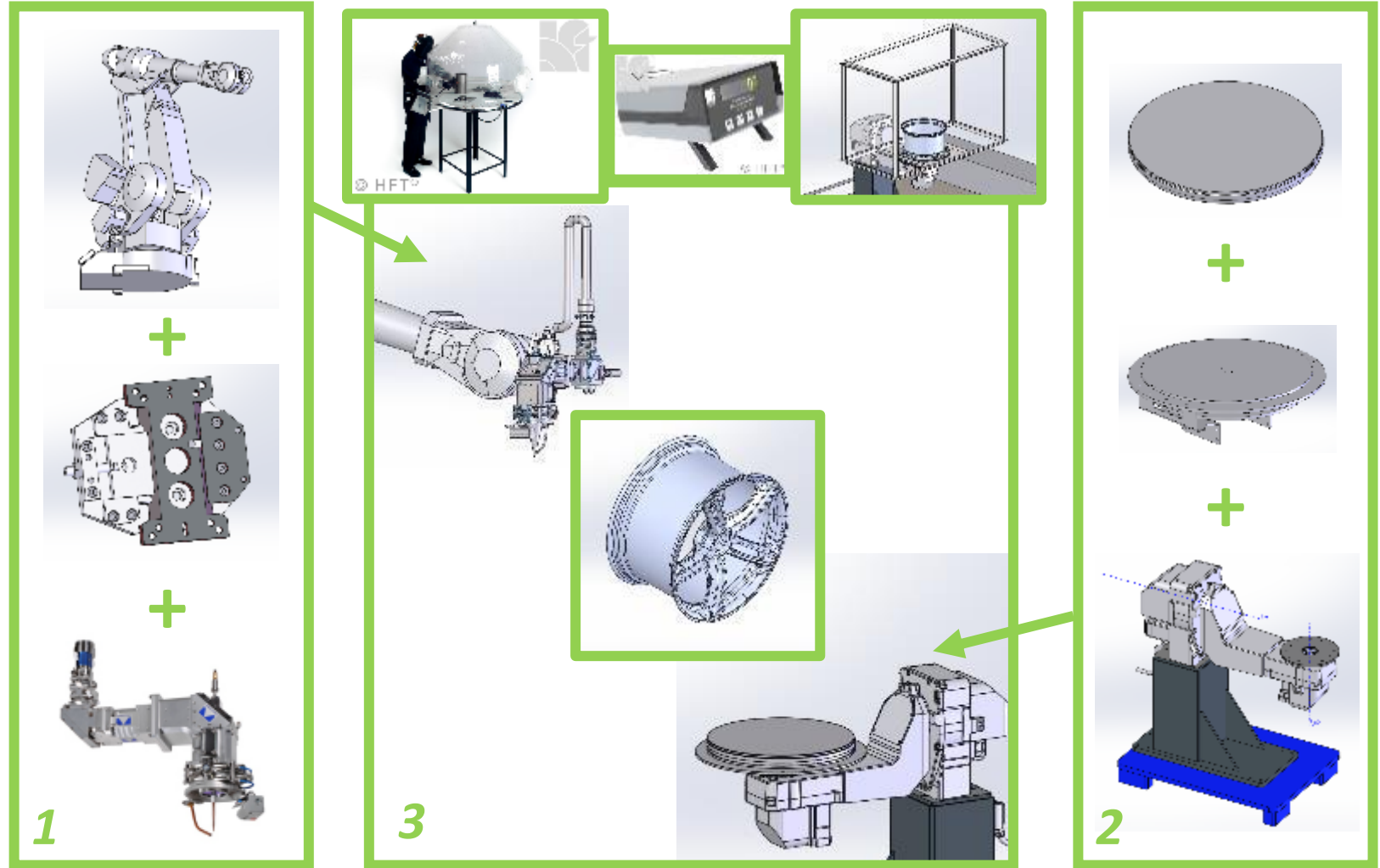


MWAM Pilot Line



**LIGHTME upgrading
new elements**

Lightme



LIGHTME MWAM CELL UPGRADES

New laser coaxial head: Melt pool is independent of the welding process from welding direction and gravity; Lower thermal impact and dilution; Lower distortion; Higher quality repeatability

New table equipped with heating system: allowing all movements and reducing thermal and residual stresses and minimizing crack susceptibility

New inert chamber: working under 50ppm of O₂ suitable for Ti, Mg and Al.

On-line Monitoring: Already developed for powder-LMD (coaxial) to be adapted to MWAM (off axis)

This project has received funding from the Industrial Technologies **Advanced Materials and Nanotechnologies** under the European Union's Horizon 2020 innovation programme under the grand agreement number **814552**.

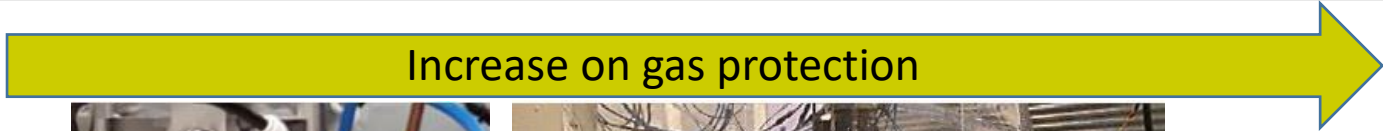
LIGHTME MWAM CELL SERVICES

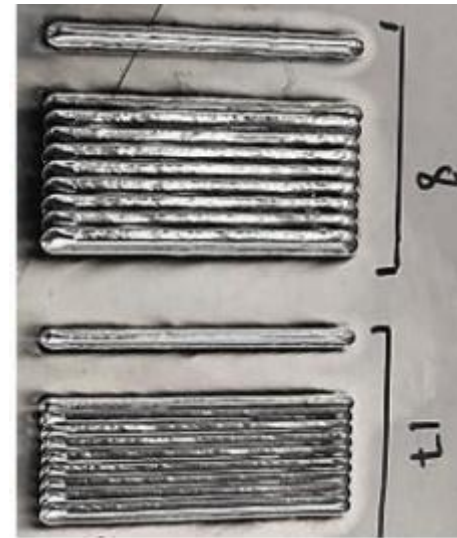
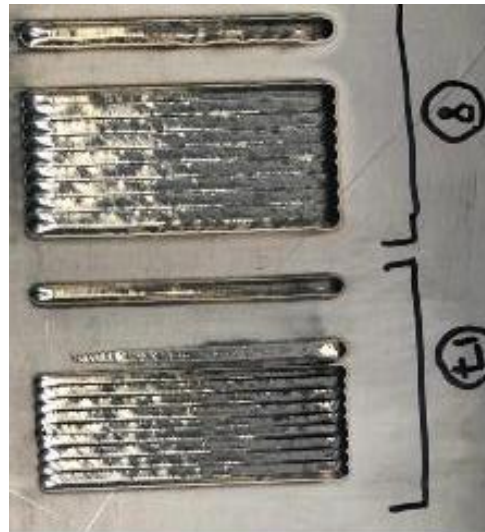
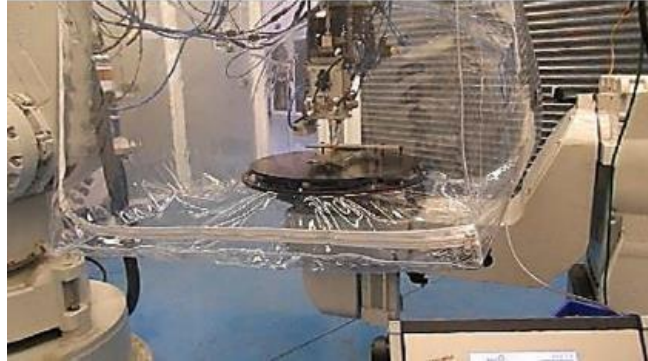
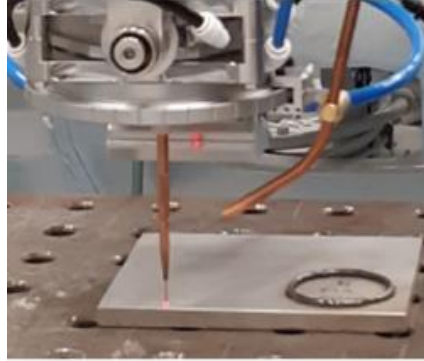


MWAM PL SERVICES

- MWAM Test Cases manufacturing
- Optimization process parameters for new materials: MMnC (Mg, Al, Ti)
- Process Monitoring
- Characterization

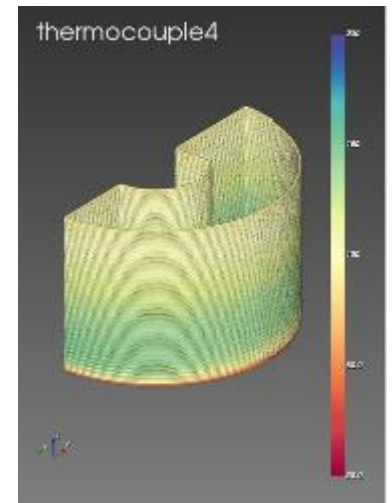
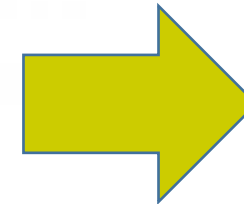
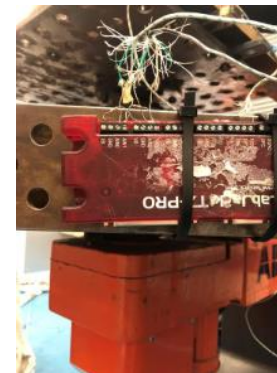
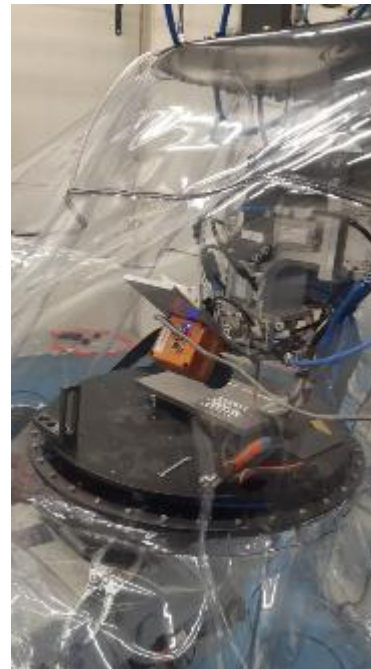
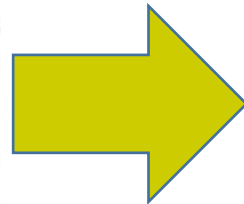
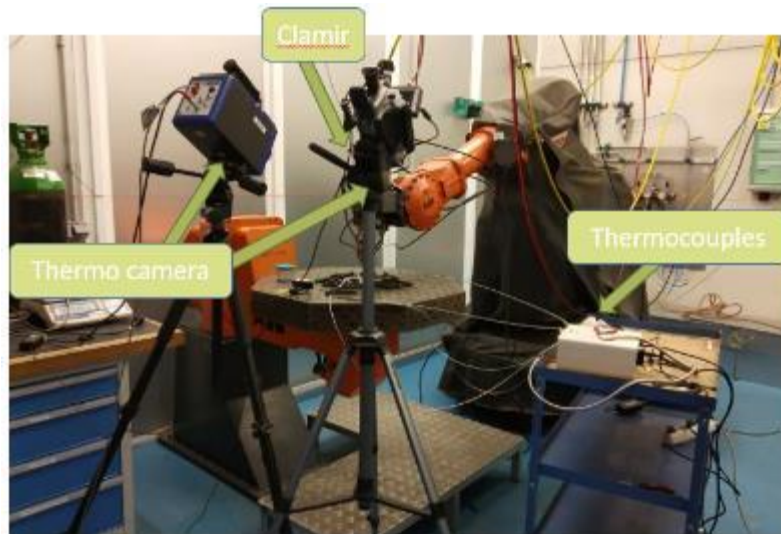
MWAM Pilot Line

Increase on gas protection 



RELATION WITH OTHER SERVICES: Monitoring capabilities (ISQ support)

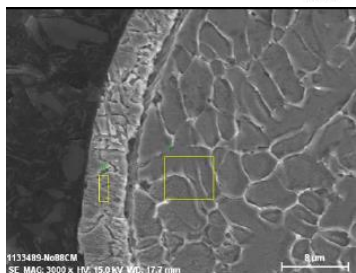
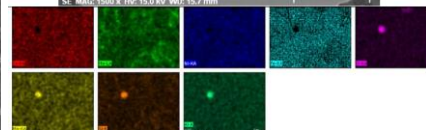
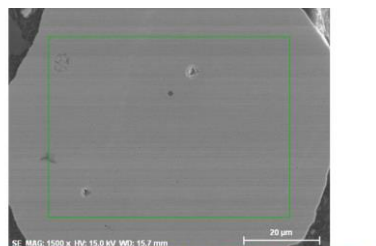
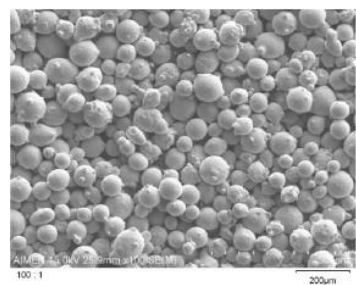
- Clamir + software MWIR melt pool monitoring
- Thermal cameras: for thermal history external monitoring
- Oscilloscope YOKOGAWA DL750 (CSV data) & Labjack (hdf5 data, up to 14 thermocouples)



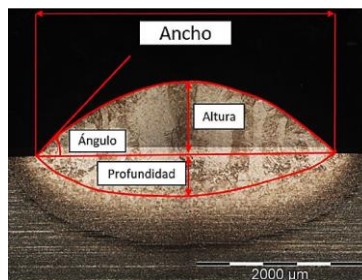
3D reconstruction from TCs data from hdf5

RELATION WITH OTHER SERVICES: testing capabilities (ISQ & Polimi support)

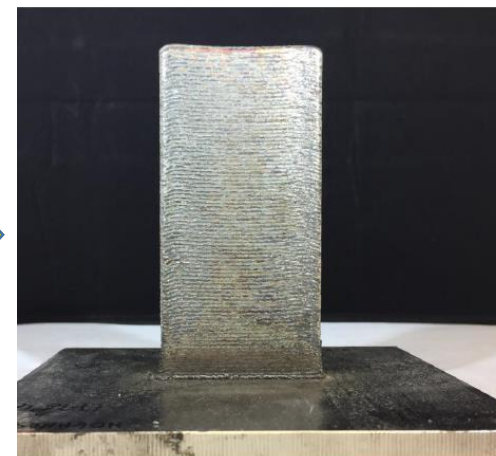
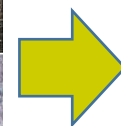
- Quality control screening: parameters window optimization.
- Standardized mechanical tests: YS, UTE, E, MODULUS
- Miniaturized tests: screening of dependant properties of location
- Microstructural analysis: OM, SEM, TEM
- NDT



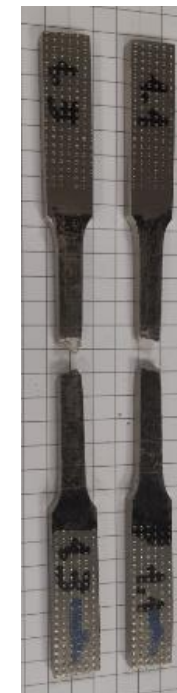
Feedstock analysis



MWAM deposits characterization

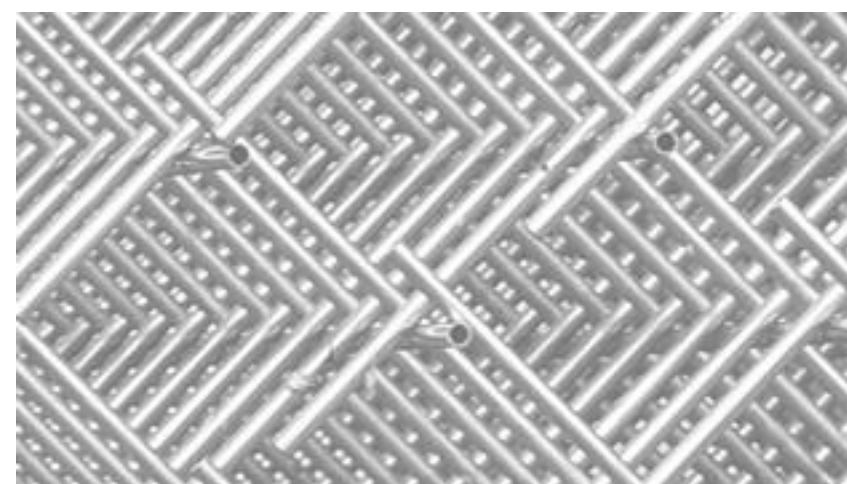
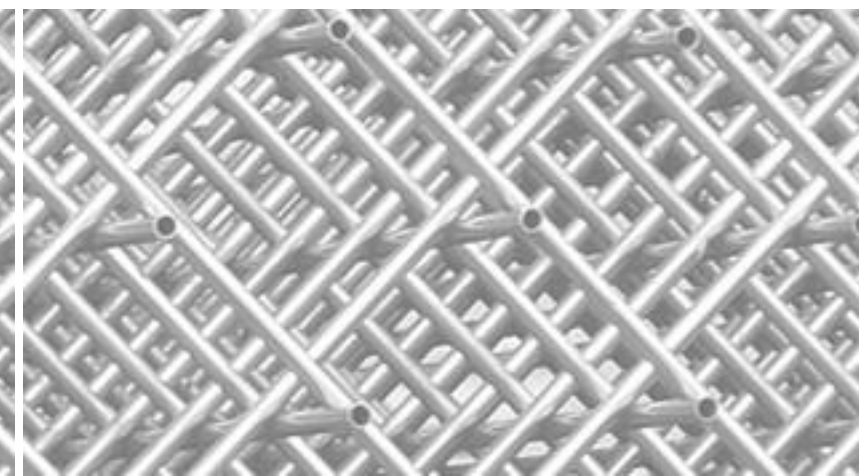
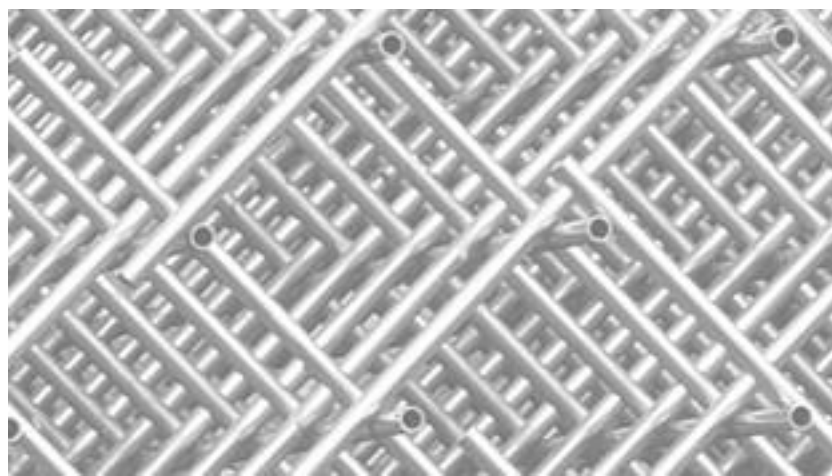


MWAM coupons/parts characterization/inspection

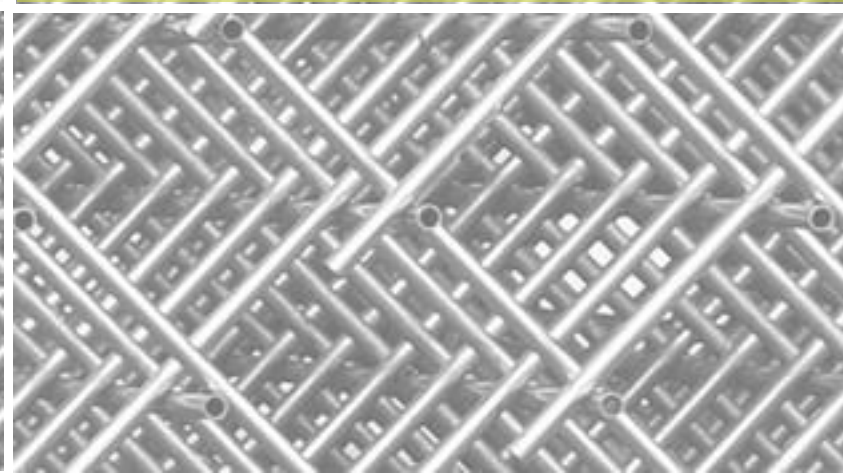
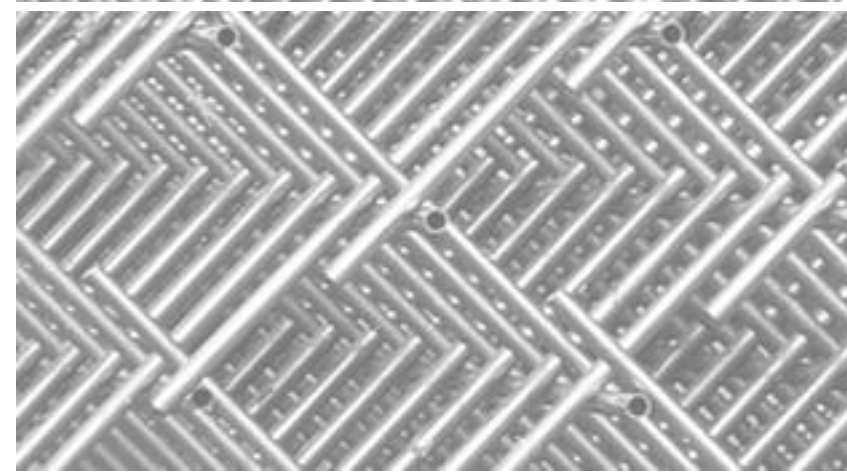




Lightme



Thank you for your attention



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