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🕒 *1 Kg. = 4 T. of fuel + 12.5 T of CO₂*

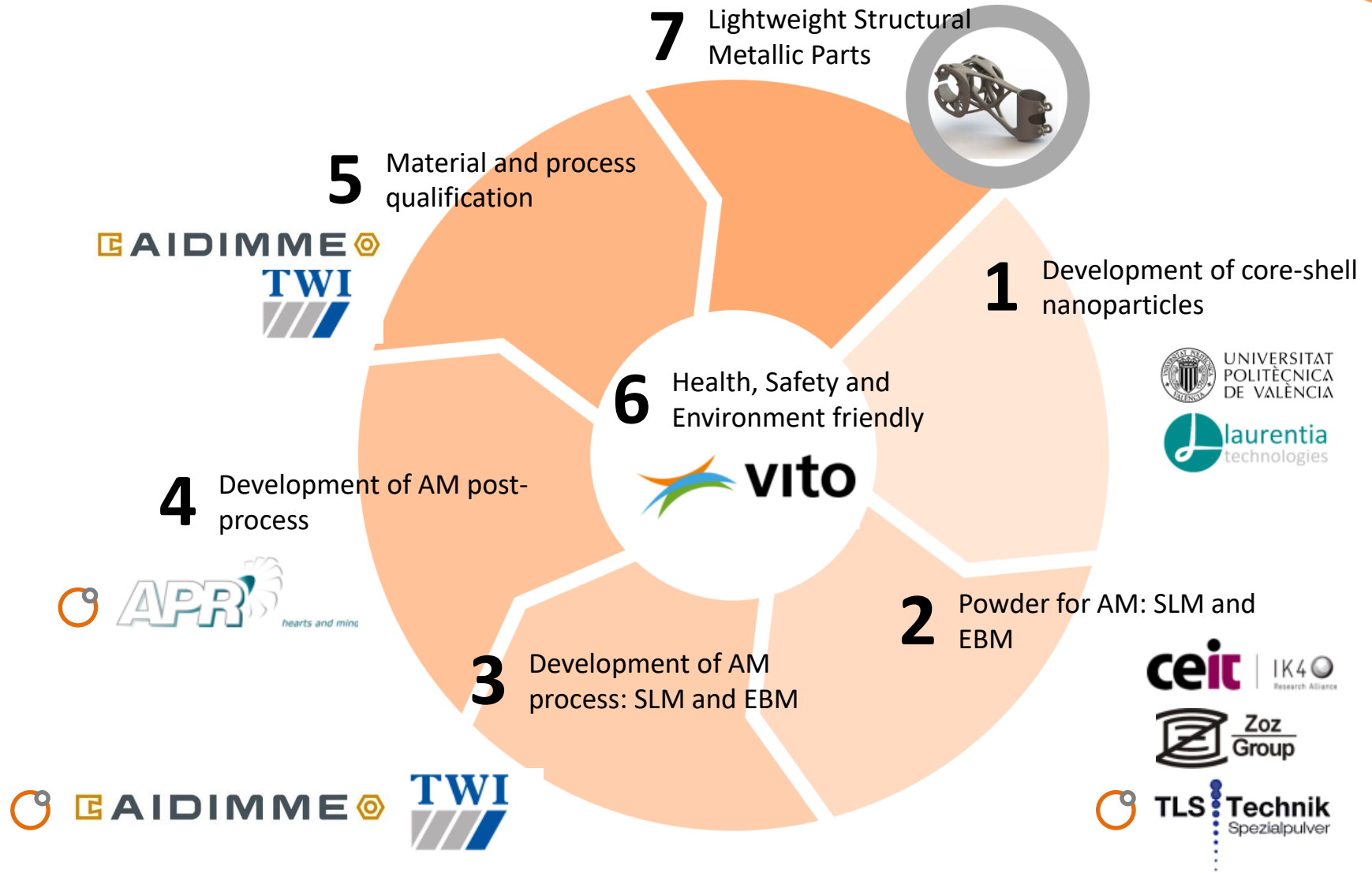
🕒 *Additive Manufacturing (AM)?*

40-90%
of weight reduction



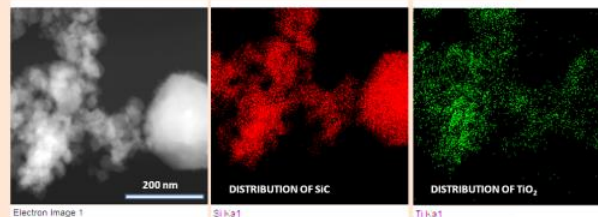
- Powder of **nano-enhanced Titanium alloy**.
- Process **available** for Additive Manufacturing.
- Health, Safety and Environment **datasheet**.

- **30% increase of mechanical behaviour** over standard Titanium alloys.
- **40% lower in material/process qualification** than current solutions on the aerospace market.



1 Development of core-shell nanoparticles

A “core-shell” concept and process (lab and industrial scale) for embedding ceramic nano-particles in the Ti6Al4V matrix.



Preliminary results:

Five core-shell systems developed in lab and industrial scale.

2 Powder for AM: SLM and EBM

The definition and scale up of two manufacturing routes for the NANOTUN3D material, based on the most popular powder production techniques: Gas atomization and EIGA.



Preliminary results:

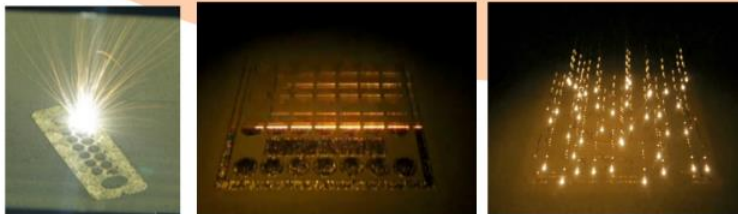
Mixing method of NPs into the metal matrix with good dispersion.

Two routes for EIGA bars production.

A novel design for GA.

3 Development of AM process: SLM and EBM

The specification of the manufacturability requirements (process specification, design rules, reusability strategy, etc.) for processing the nanomodified Ti6Al4V by two AM technologies: Selective Laser (SLS) and Electron Beam (EBM).



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Preliminary results:

Decision made on early screening of the mixed/consolidated samples on AM techniques (SLM/EBM).

4 Development of AM post-process

The postprocesses needed by the AM NANOTUN3D part: machining, surface and heat treatments.

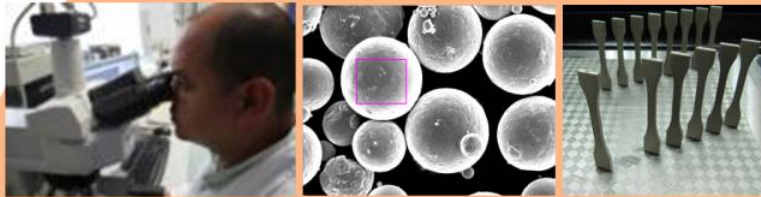


Preliminary results:

Study on surface and heat treatment on standard Ti6Al4V processed by AM as reference.

5 Material and process Qualification

A qualification approach of the developed material and transformation processes.



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Preliminary results:

Qualification approach developed of material and process.

Preliminary feedback from European Aviation Safety Agency (EASA).

6 Health, Safety and Environment friendly

The development and Implementation of a Health and Safety Management System to ensure near 0 risks associated with the use on the NANOTUN3D technology from core-shell production to final part.



Preliminary results:

Data on exposure and effects, together with available data from literature and physico-chemical characteristics is integrated to obtain a HSE management system.

7 Lightweight Structural Metallic Parts

NANOTUN3D material will be an enhanced Ti6Al4V for AM with an improvement of the mechanical behaviour by 30% with no weight penalty in comparison with standard Ti6Al4V.

NANOTUN3D will be ready for developing new lightweight structural parts reducing the time for qualification by 40%.

NANOTUN3D will be ready for being used in a safe manner along its life cycle with near 0 risks.



We offer...

Consultancy 

Materials: NPs, powders 

Research 

Post-treatments 

Testing 

...to this customers.

 *Manufacturers*

 *Service providers*

 *Material providers*

 *AM technology providers*

 *IT developers*

*If you have in mind to
lightweight your products
with confidence,
become a tester!*

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Posters available at EuroNanoForum 2017

“We are looking for case studies!”

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