

Titanium is critical for key industries such as aerospace, defence and advanced manufacturing.

Europe's titanium supply chain is import-dependent, energy-intensive and highly wasteful.



IMPORT DEPENDENCY

Heavy reliance on titanium imports exposes Europe to supply and geopolitical risks.



HIGH ENERGY DEMAND

Conventional processing relies heavily on energy-intensive processes.



LOW CIRCULARITY

Valuable titanium from waste and end-of-life components remains underused.

EMPowerMet
aims to
change this.

EMPowerMet brings together **15 partners** across **7 European countries**, spanning research organisations, universities and industrial partners.



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Project n° 101294194



EMPOWERMET



**Electric &
Mechanical
Power for Metal
Manufacturing**

Empowering a circular
Titanium value chain

EMPowerMet addresses this challenges by developing a fully circular and energy-efficient titanium value chain based entirely on secondary resources.



ELECTRIC & MECHANICAL PROCESSES

The project intends to develop and demonstrate novel electrically and mechanically driven processes for low-carbon titanium recycling and manufacturing.

EMPowerMet will transform titanium swarf and end-of-life components into high-performance semi-finished products, such as sheets and wires, reducing energy use, material losses and environmental impact.



DIGITAL PRODUCT PASSPORT

A Digital Product Passport (DPP) will enable traceability and transparency of recycled titanium across its lifecycle, supporting a more circular value chain.



EUROPEAN INDUSTRIAL RESILIENCE

By replacing fossil-fuel-intensive processes with electrically and mechanically driven technologies, EMPowerMet reduces titanium import dependency, GHG emissions and resource use, strengthening Europe's industrial resilience and advancing sustainable manufacturing across energy-intensive sectors.

Advancing sustainable titanium processing and enabling wider adoption of cleaner manufacturing in energy-intensive industries.



ADVANCED RECYCLING TECHNOLOGIES

The project introduces solid-state recycling technologies, Field-Assisted Sintering (FAST) and CONFORM™, to transform titanium swarf and end-of-life parts into high-performance sheets and wires, further processed through deep drawing, wire-arc DED and inductive heat treatment into hybrid components with reduced energy and material use.



INDUSTRIAL VALIDATION

Three industrial demonstrators at TRL 7: a fire protective helmet, space landing gear structures and an aircraft service port; will validate the sustainable titanium value chain.



Demonstrator 1

Fire Protective Helmet

100% recycled titanium helmet, deep drawn from FAST sheets and finished with wire-arc DED.



Demonstrator 2

Space Rider Landing Gear Structures

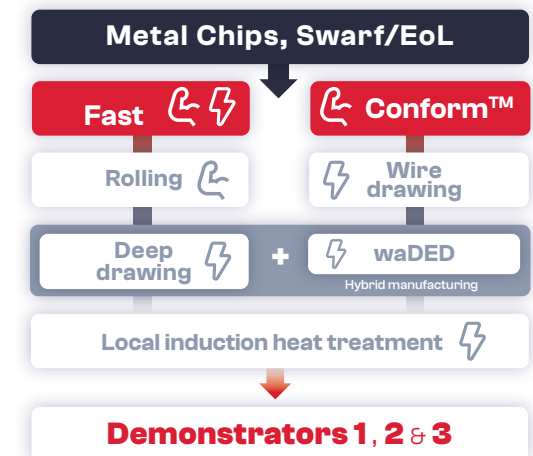
Space Rider landing gear structures combining a FAST substrate with wire-arc DED for high strength and low mass.



Demonstrator 3

Aeroplane Service Port

Corrosion-resistant aircraft service port made from FAST + rolled titanium sheets with wire-arc DED features.



EMPowerMet scheme of technological steps from scrap metal to advanced hybrid-manufactured demonstration objects.