



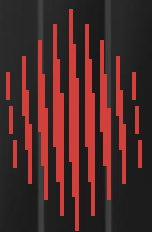
**AMAZEMET – your advanced manufacturing partner**

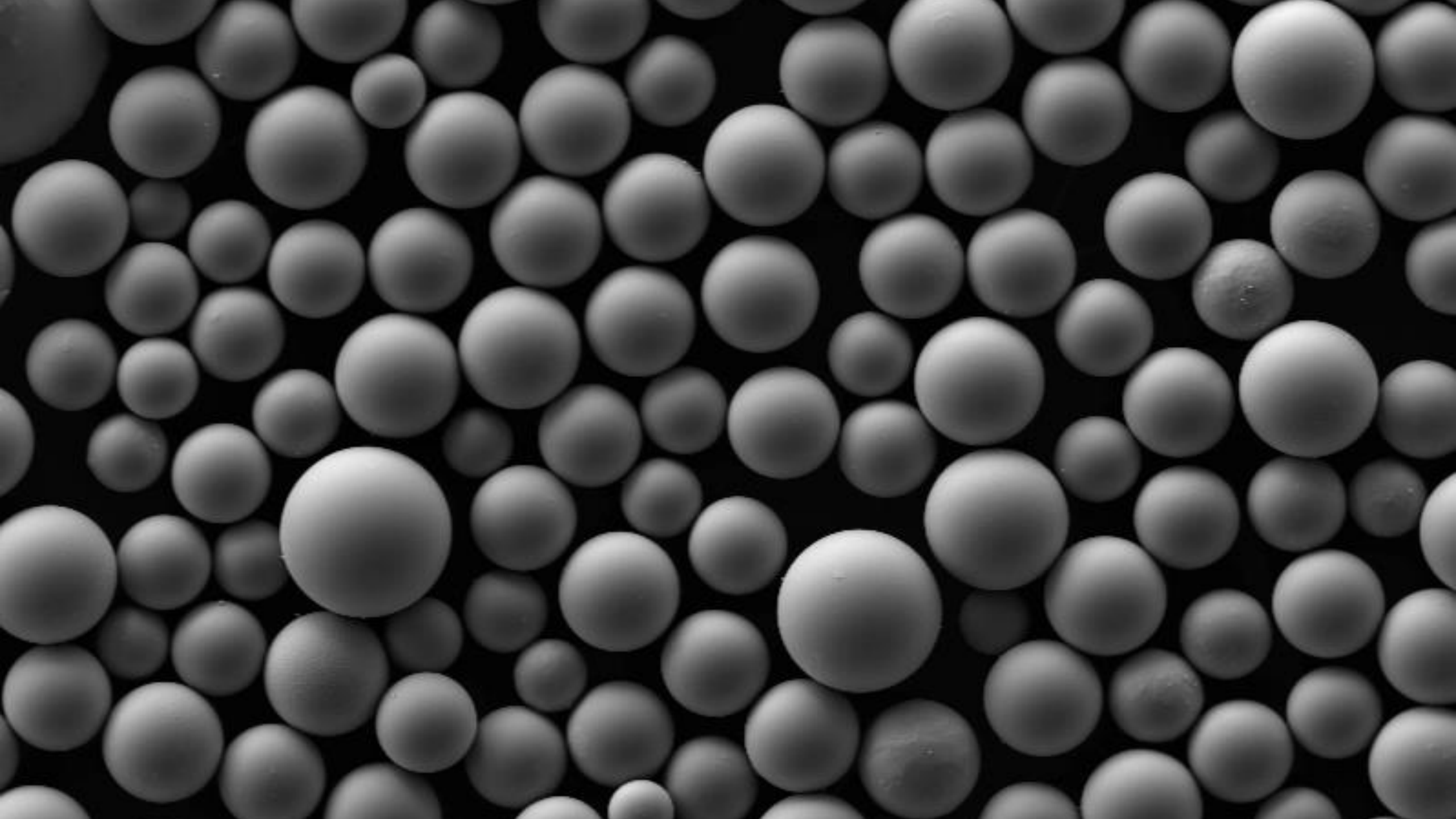
**Łukasz Żrodowski**

**AMAZEMET, CEO**

**Carnegie Mellon University, Adjunct Profesor**

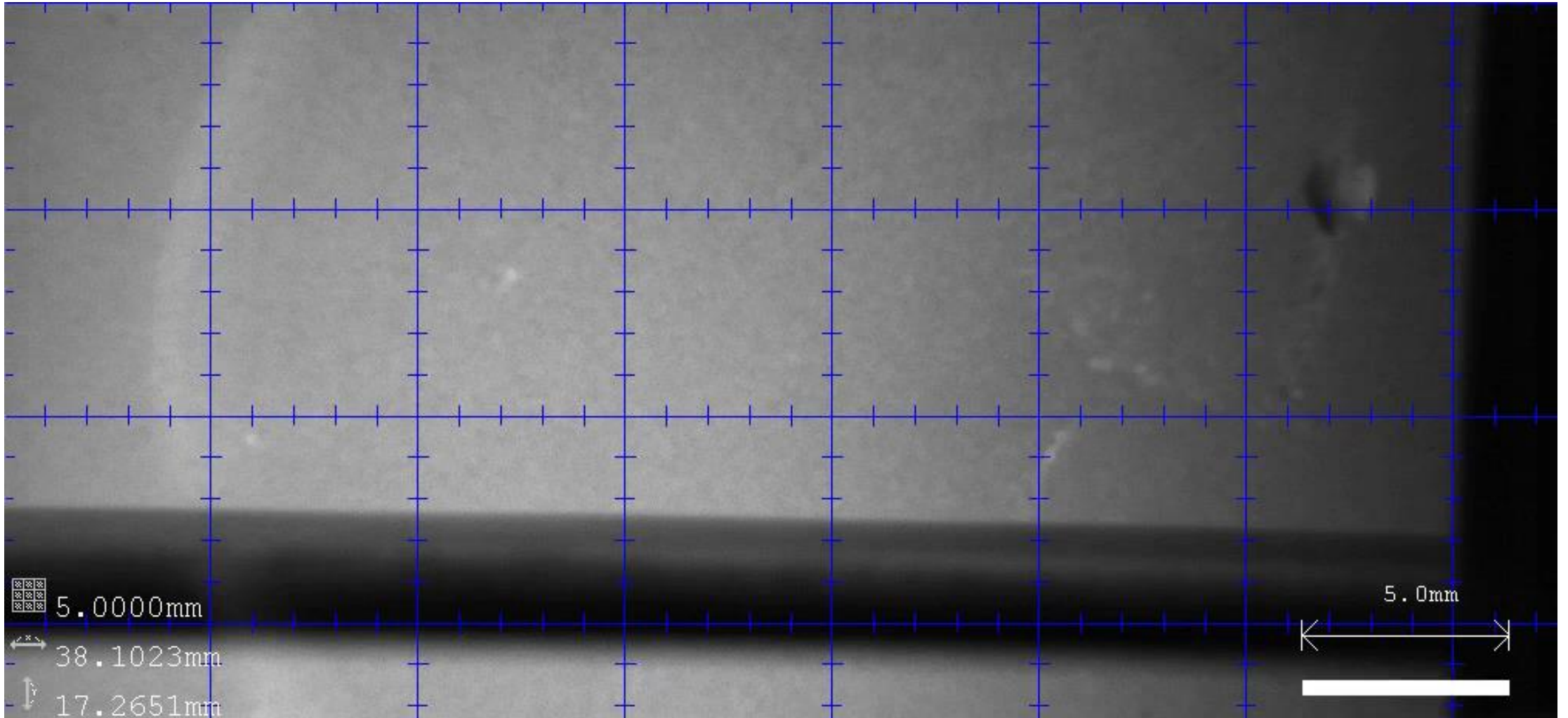
**[Lukasz.zrodowski@amazemet.com](mailto:Lukasz.zrodowski@amazemet.com)**





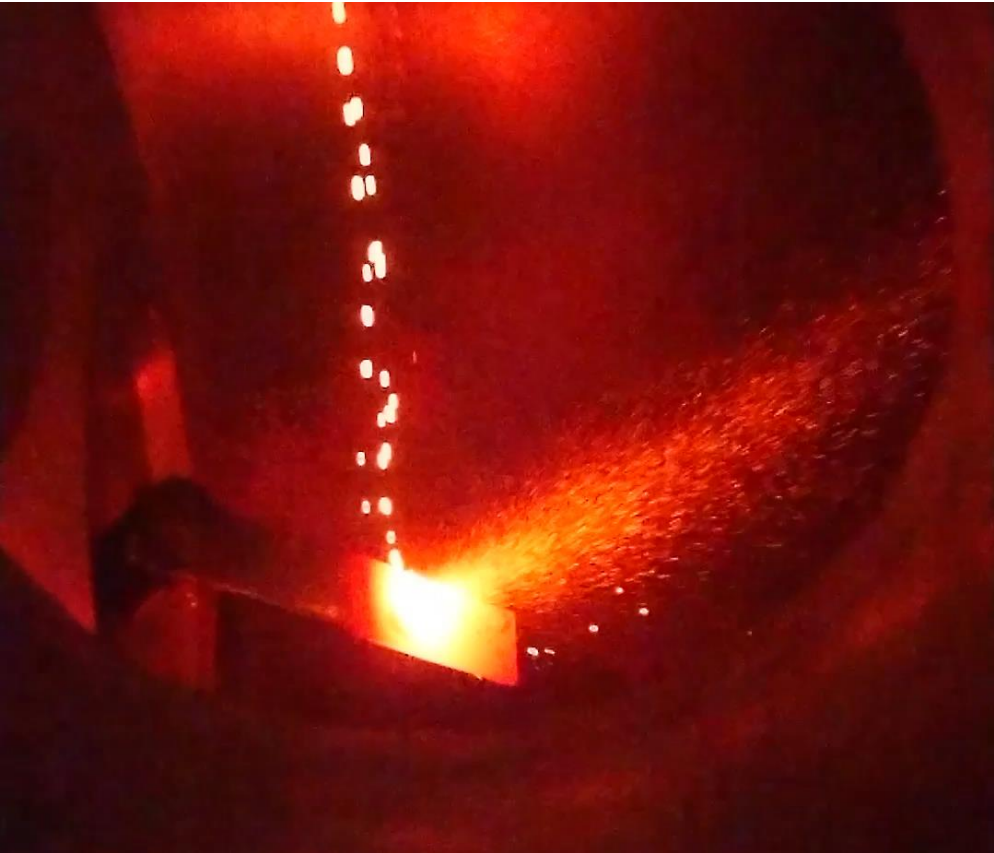
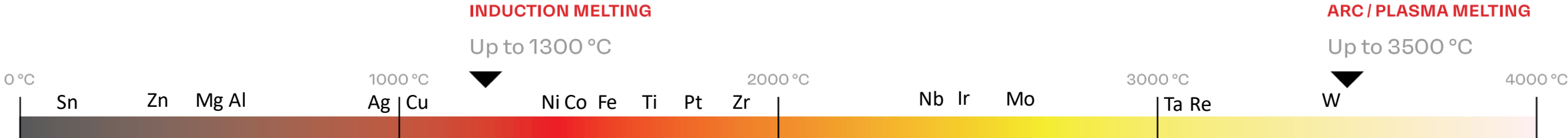
# ULTRASONIC ATOMIZATION – HOW IT LOOKS LIKE?

rePOWDER

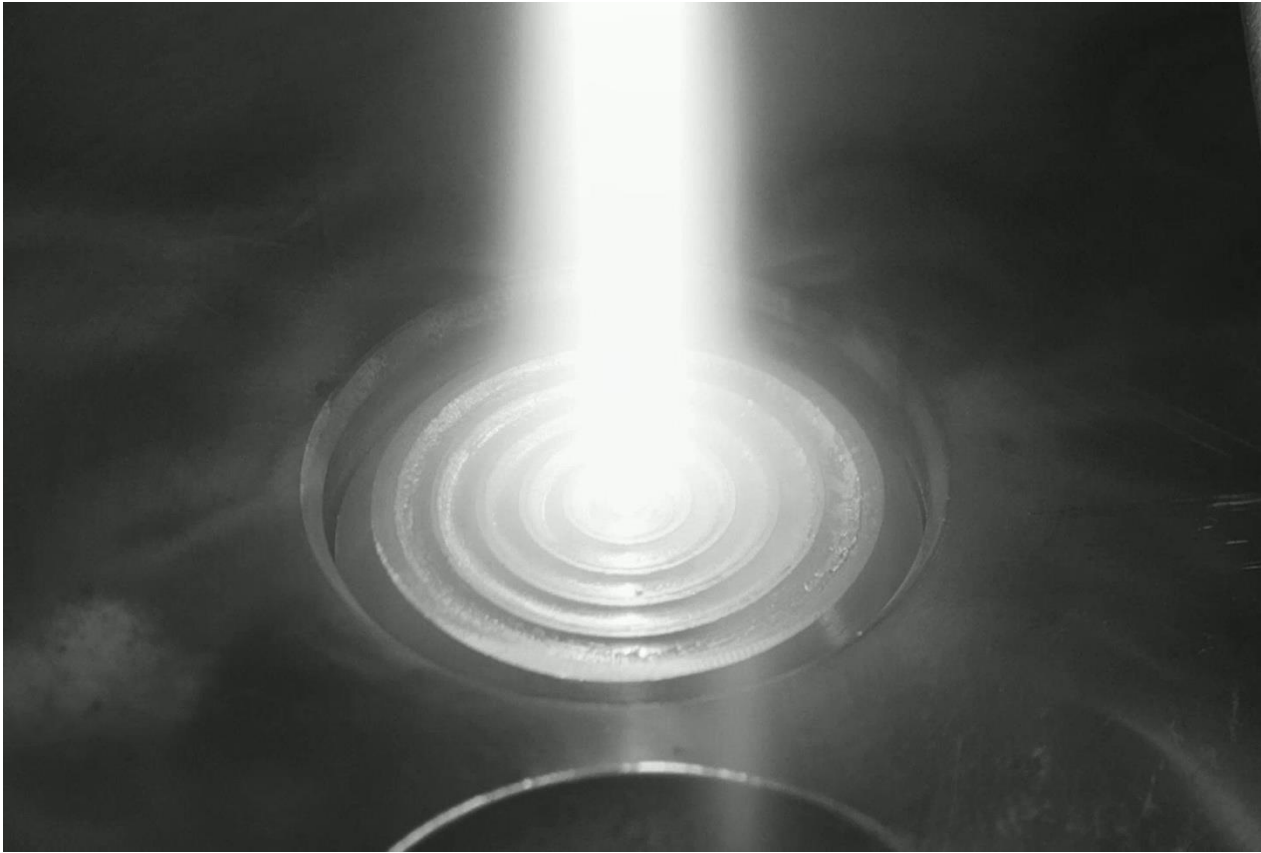


# ULTRASONIC ATOMIZATION

rePOWDER



Induction (Pat. US12416067)



Plasma (Pat.US11938557)

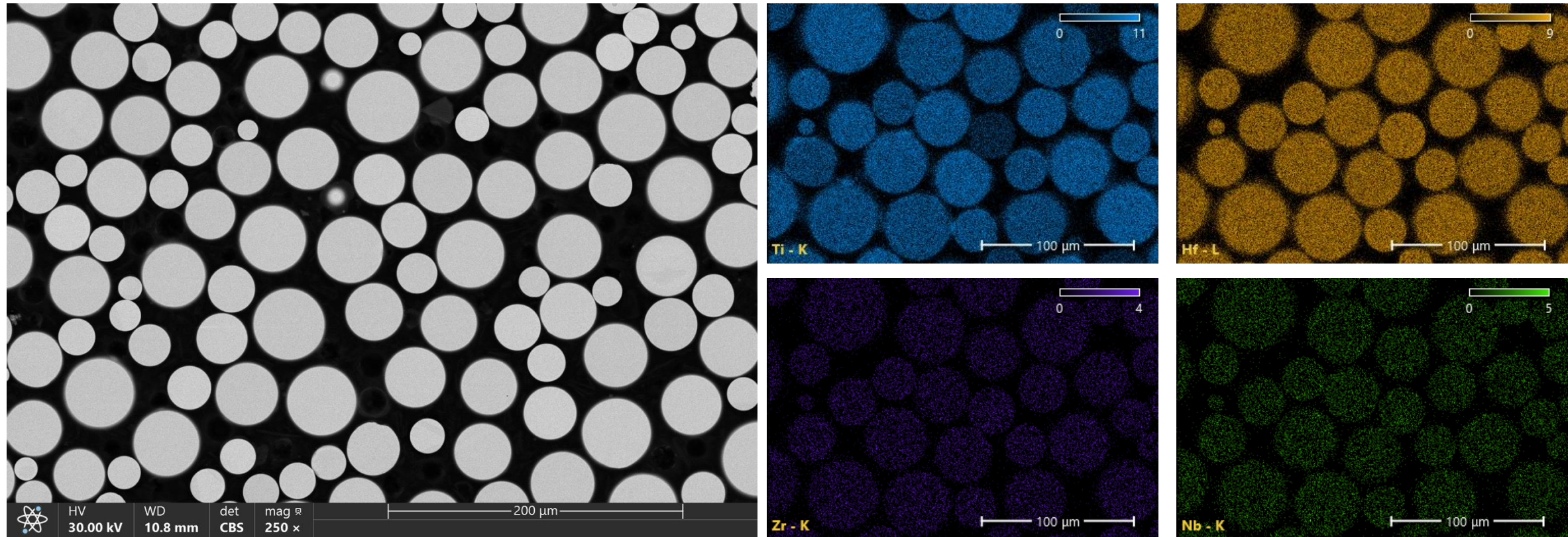
 **AMAZEMET**



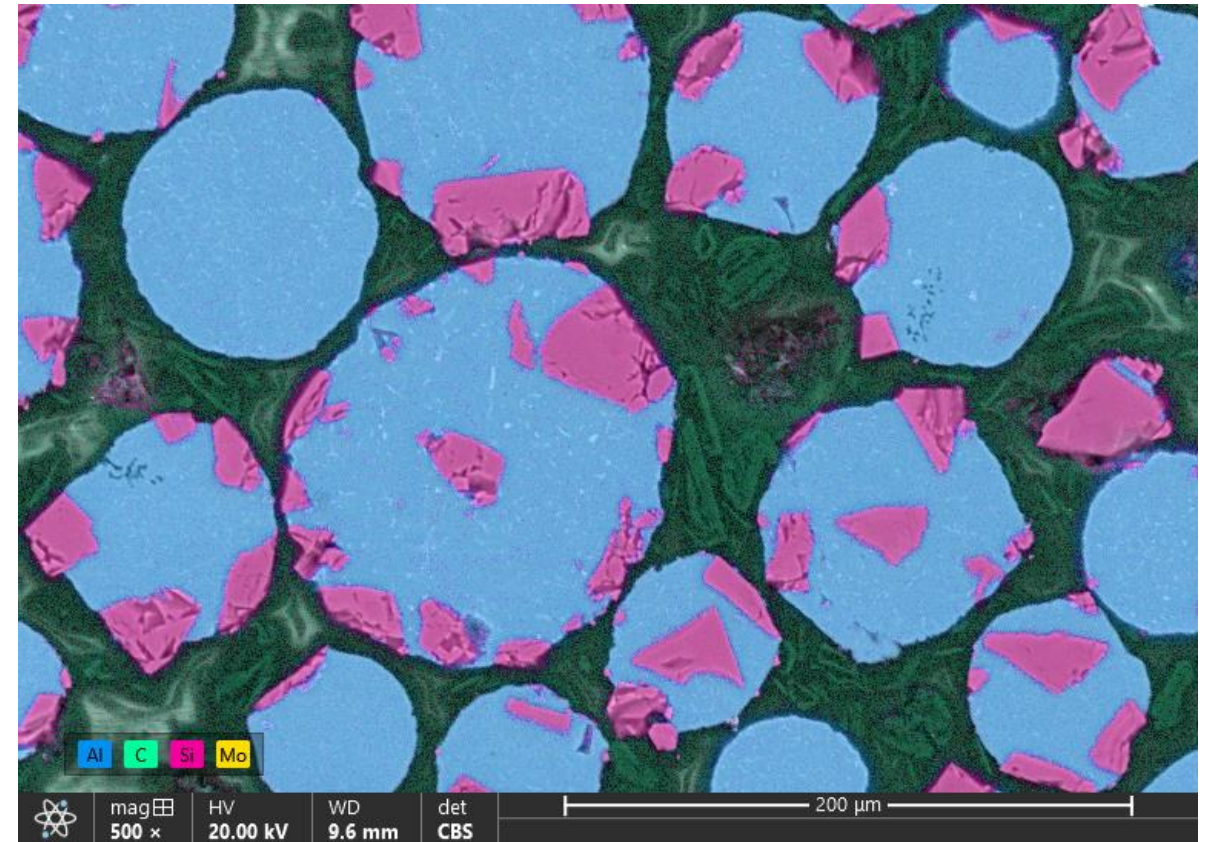
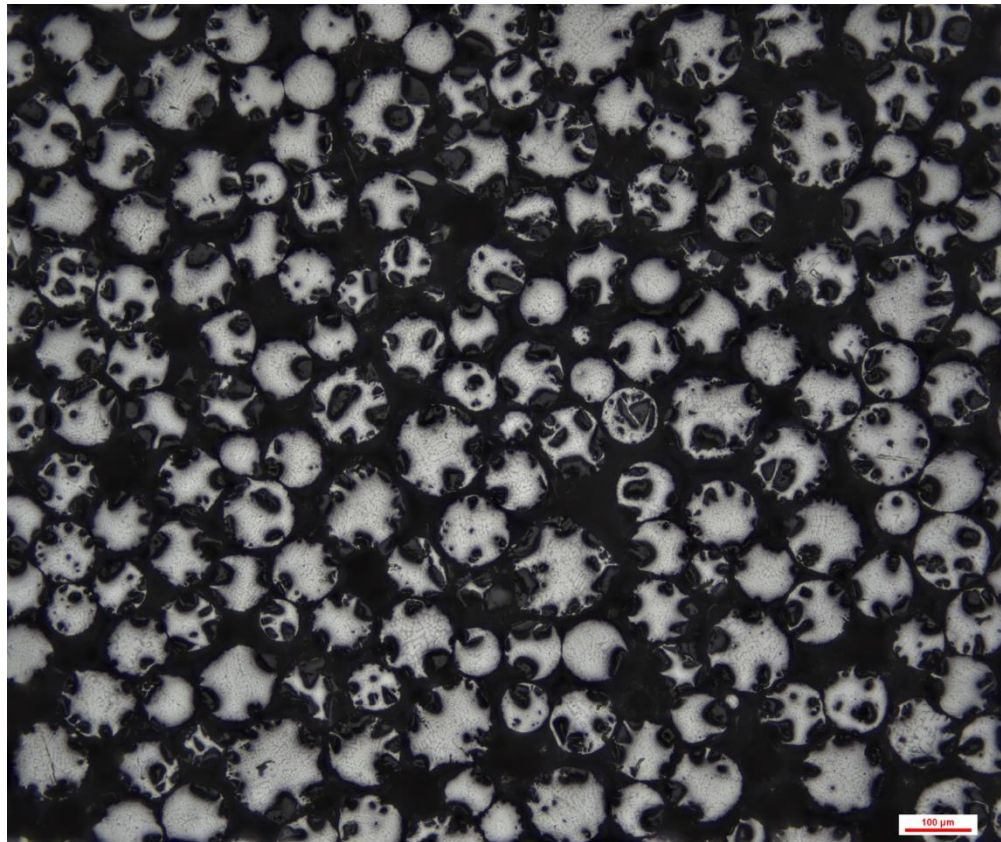
powder**2**POWDER

# New material development – high entropy alloys

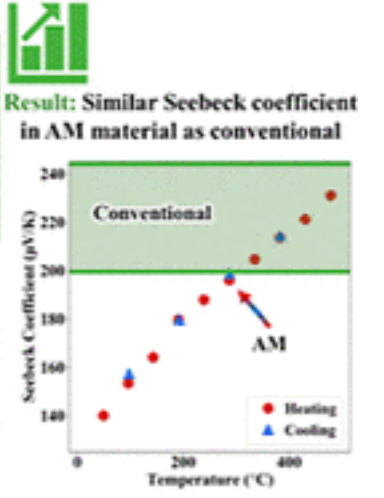
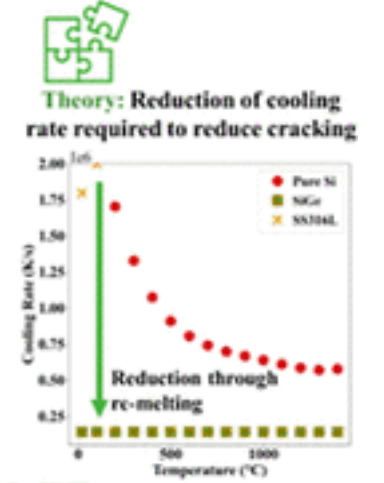
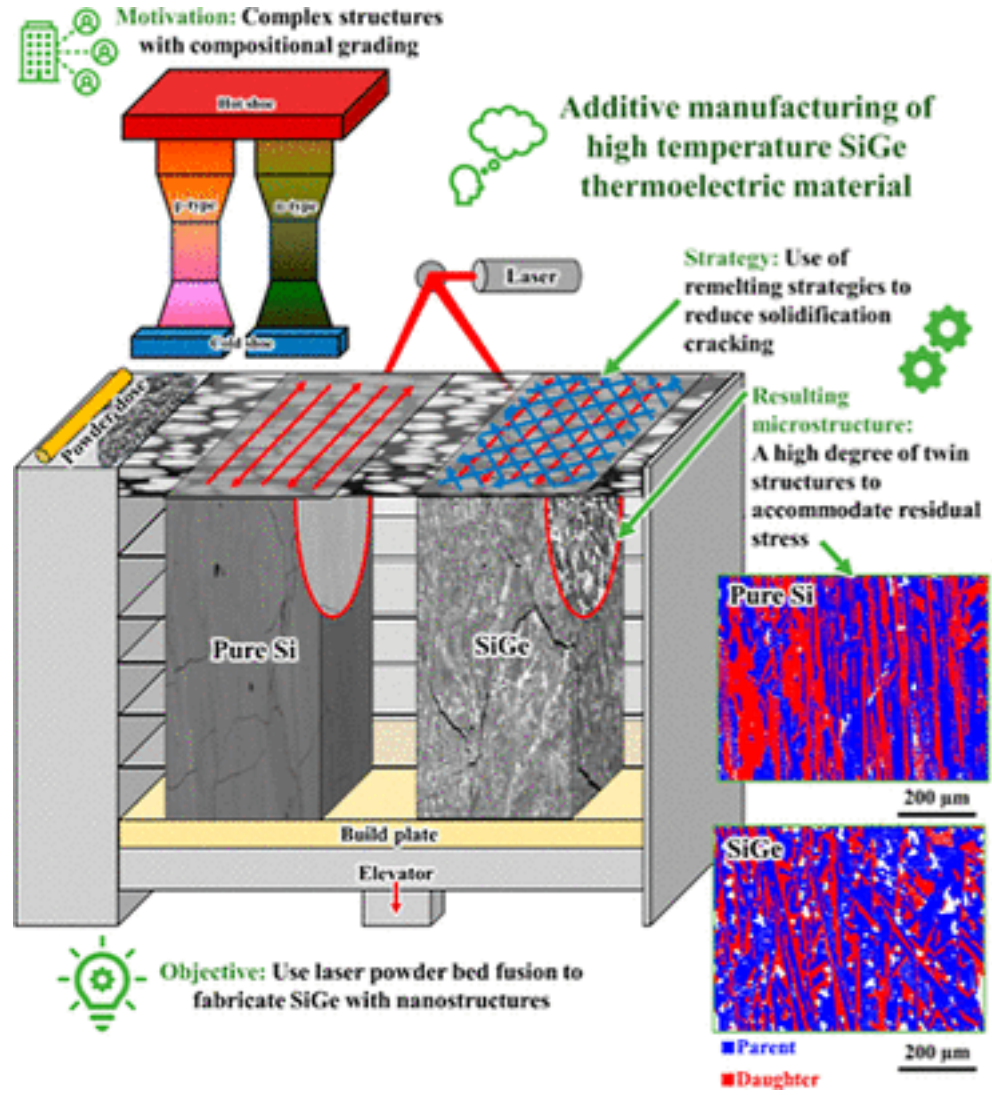
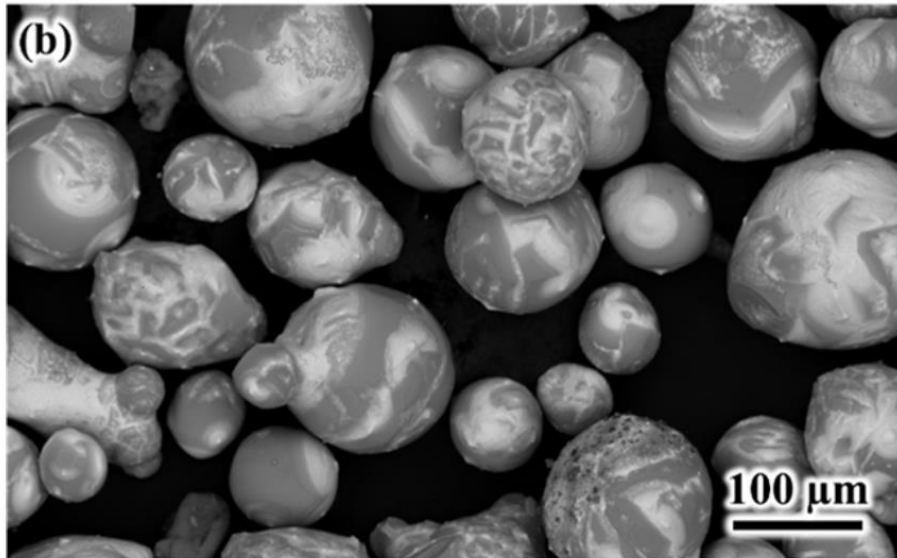
NbZrHfTi equimolar alloy (Nb: 22.64 wt% Zr: 22.22 wt% Hf: 43.48 wt% Ti: 11.66 wt%)



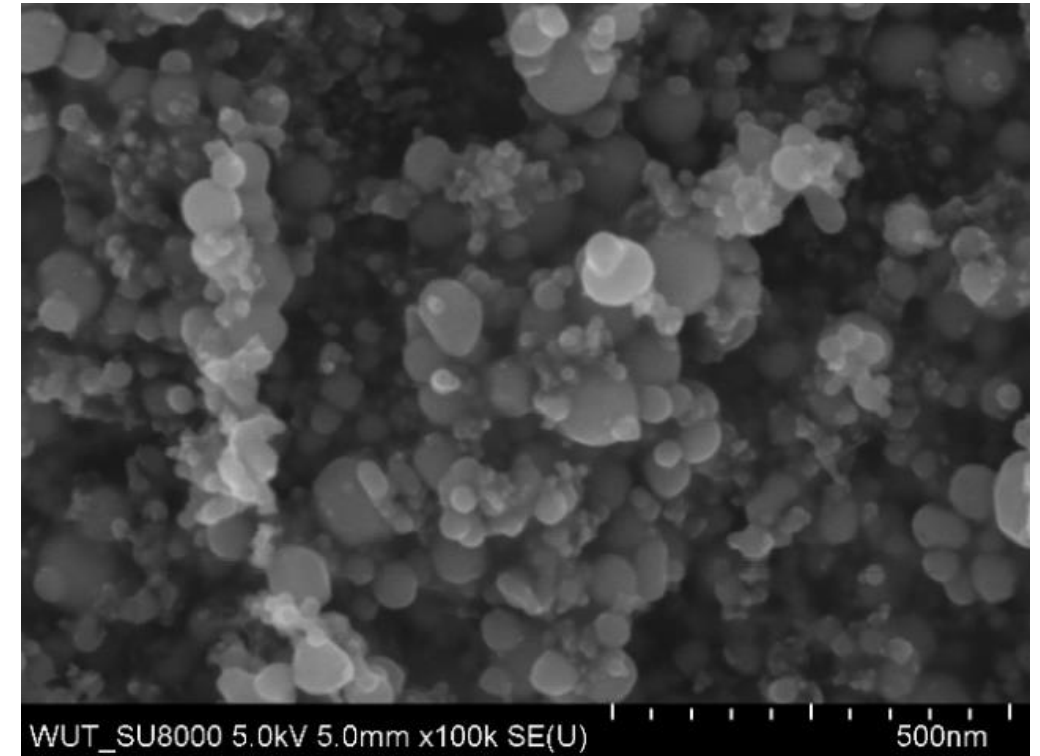
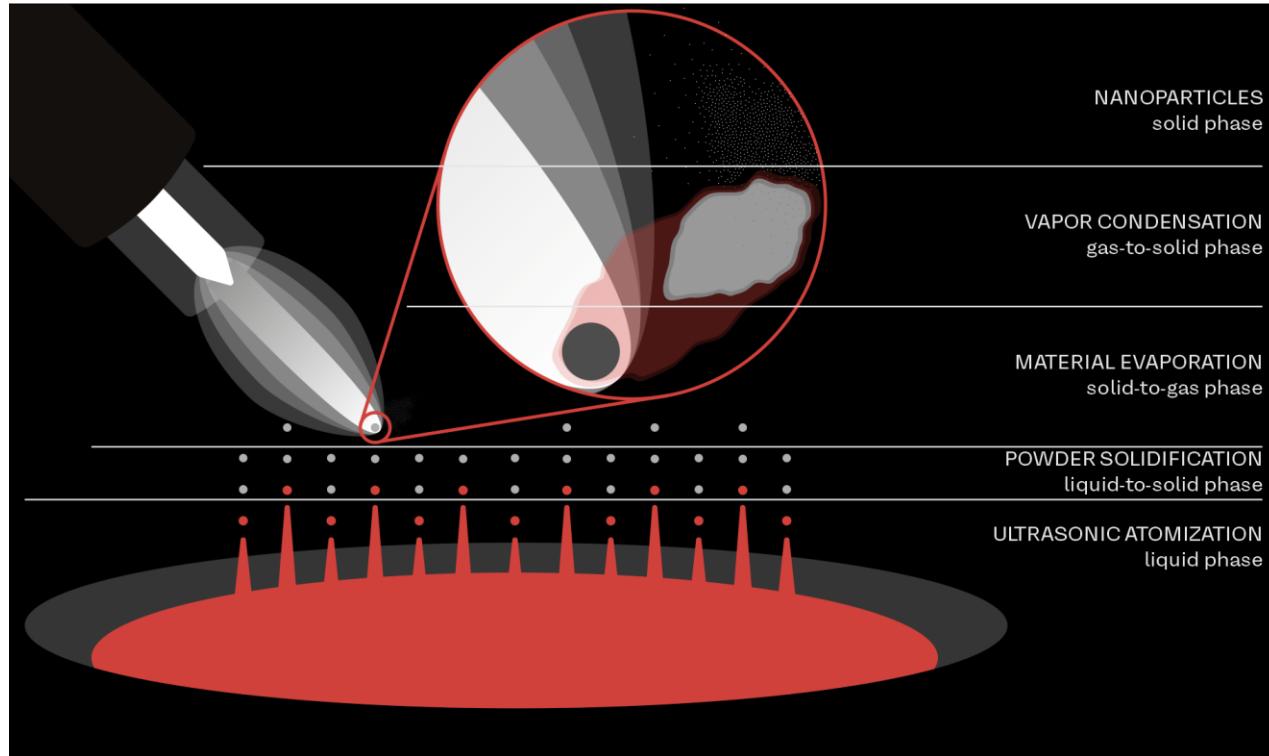
# METAL MATRIX COMPOSITES



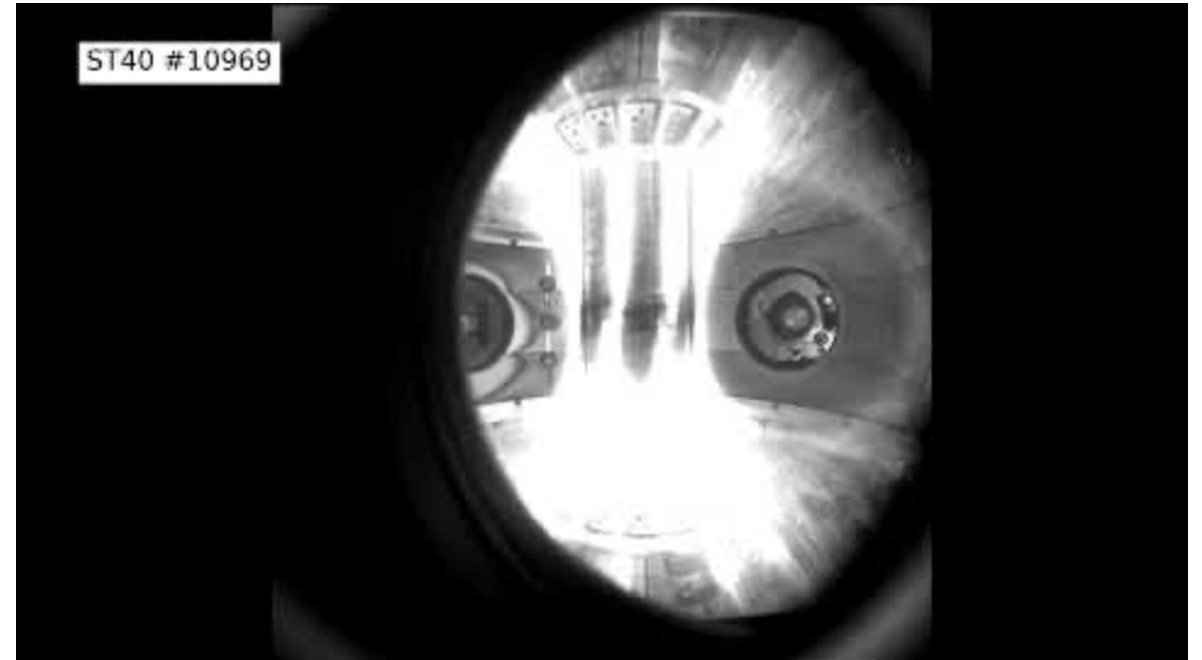
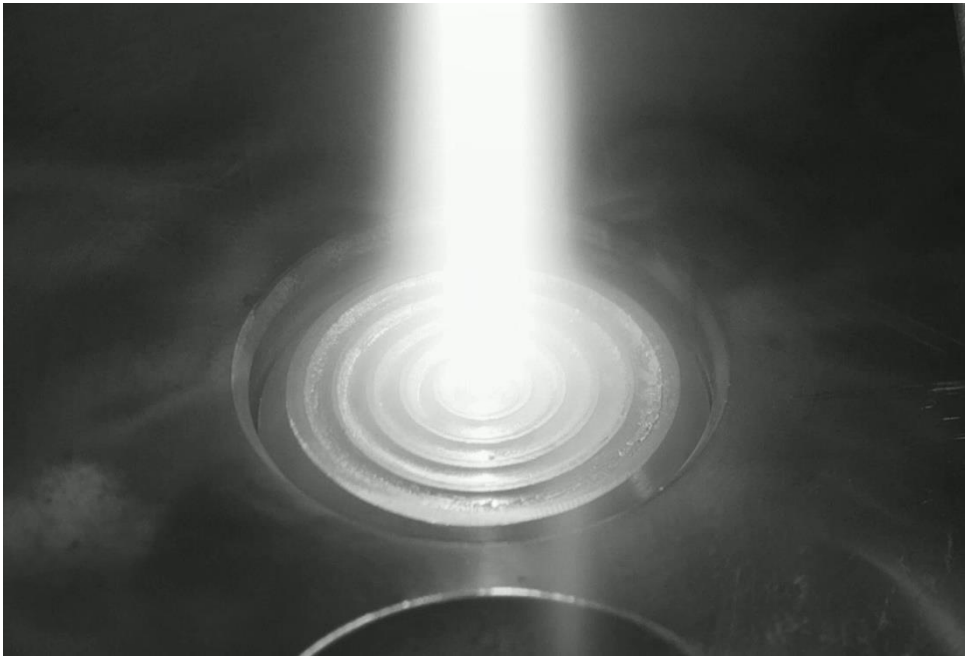
# THERMOELECTRIC MATERIALS – SI AND SIGE WITH ORNL



# Nanoparticles for non-LPBF AM and propulsion



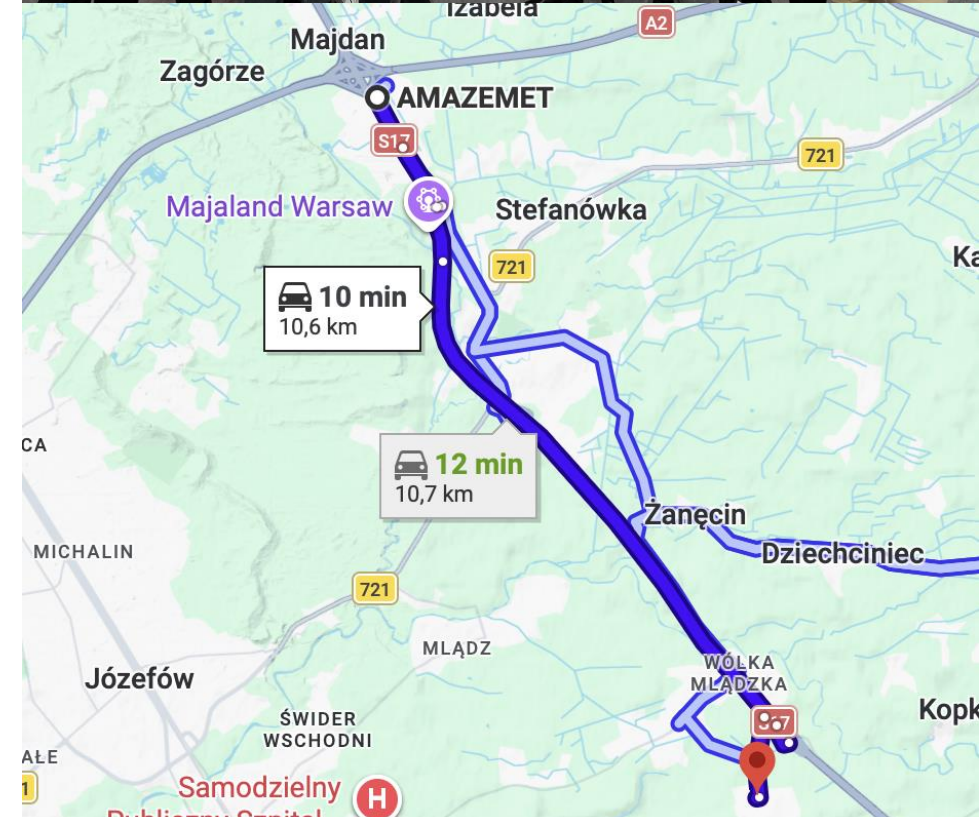
## Plasma facing materials – rePowder and Tokamaks



ITER works were relevant to our development – now it is time to give it back to community

# THE COMPANY & NEIGHBOUR

- 64 employees including:
  - 2 PhDs
  - 5 PhDs studnets
- Recognized scientific contributions of our team:
  - Over 100 scientific publications
  - 12 ongoing joint R&D projects with leading EU scientists
- IP protected by 18 patents an applications
- Poland-based production facility and own lab equipped with modern apparatus and equipment
- Vertically integrated production line
- US-based distribution company in the process of being integrated into the company's structure



# OUR APPROACH – MACHINES AND MATERIALS

We use **patented ultrasonic technology** to produce and recycle critical materials powders. This approach minimizes energy use and costs while addressing the challenges of traditional methods. Business scaling relies on material recycling services.

## EQUIPMENT

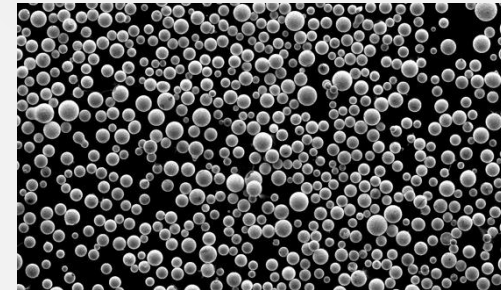


**Problem:** Large-scale equipment makes powder production inaccessible for small-scale applications, hindering R&D in advanced manufacturing

**Solution:** Our **rePowder R&D device** to address internal supply chain challenges, providing an in-house solution for powder production

**Customers:** R&D institutions and specialized production centers

## MATERIALS

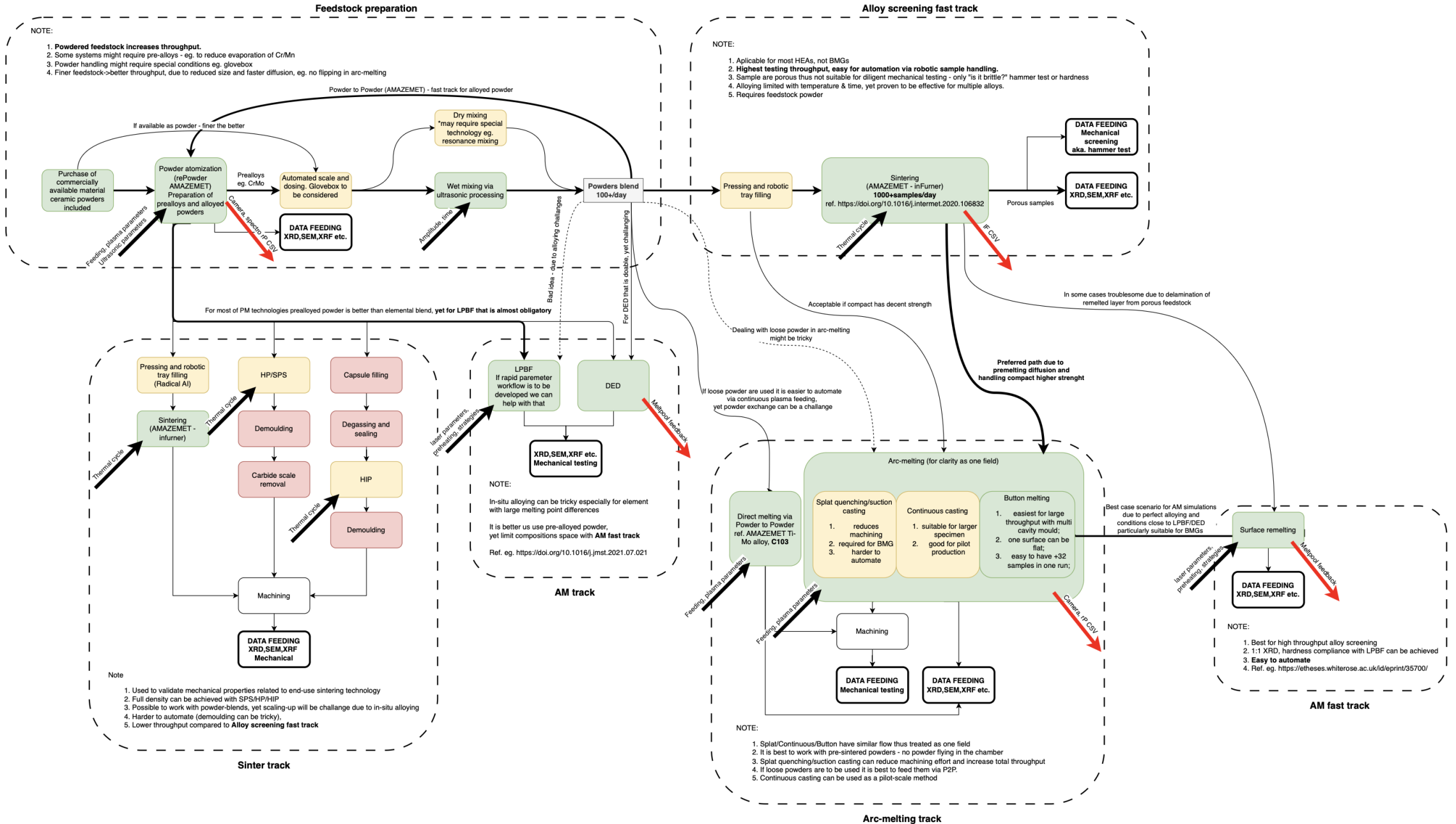


**Problem:** Out-of-specs powder cannot be recycled and is stockpiled by users and producers

**Solution:** Our Powder2Powder technology significantly reduces production costs enabling cost-effective powder recycling

**Customers:** Service providers and powder manufacturers

# INTEGRATED DEVELOPMENT WORKFLOW



# OPEN FOR R&D COLLABORATIONS

AMAZEMET

## CUSTOMERS



NORTHWESTERN  
UNIVERSITY



Lawrence Livermore  
National Laboratory

Quebec Metallurgy Center  
**CMQ**  
Centre de métallurgie du Québec



**Alloyed**

Fraunhofer  
IWU



## PARTNERS



Heraeus  
**AMLOY**



# OPEN FOR R&D COLLABORATIONS

AMAZEMET

BIOMET4D



GlobalAM



NewAIMS

## 10 GRANTED International PROJECTS

- **AM2SoftMag** - Additive Manufacturing of Amorphous Metals for Soft Magnetics [[EIC Pathfinder](#)]
- **3D-BioMg**- Development of additively manufactured magnesium-based biodegradable scaffolds and implants for orthopedic applications [[POLTUR](#)]
- **IronWorkCoat** - Development of High-Manganese steels for coating systems by work hardening for sustainable wear protection applications [[M-ERA.NET](#)]
- **NewAIMS** - New Approach to Additive Manufacturing of Microstructurally Optimized Steels [[Research Fund for Coal and Steel](#)]
- **HighMag** - High-energy, low-cost, and scalable generation 5 magnesium-based batteries for mobility applications [[HORIZON-RIA](#)]
- **Sunflower** - Sustainable Near-net-shape Fabrication of Low Environmental impact Receiver materials [[Clean Energy Transition Partnership](#)]
- **Global AM** - Enabling Laser Powder Bed Fusion for Large Scale Production of Multi-Material Components [[HORIZON-CL4-2023-TWIN-TRANSITION-01](#)]
- **BIOMET4D** - Smart 4D BIODEgradable METallic Shape-shifting Implants for Dynamic Tissue Restoration [[EIC Pathfinder](#)]
- **Core-H2storage** – resource-efficient storage of hydrogen at ambient temperature – HEAs - TiVZrNbHf [[Clean Energy Transition Partnership](#)]
- **AM4Plasma** - Laser powder-bed-fusion Additive-Manufacturing of complex Multi-material Refractory-Copper Plasma generation devices [[EUREKA](#)]



# AMAZEMET – partner for materials development



## Looking for partners:

- Clope-loop of critical materials processing
- In-house small scale atomization
- New alloy development
- Powder storage reduction
- Powders for propulsion and energetics



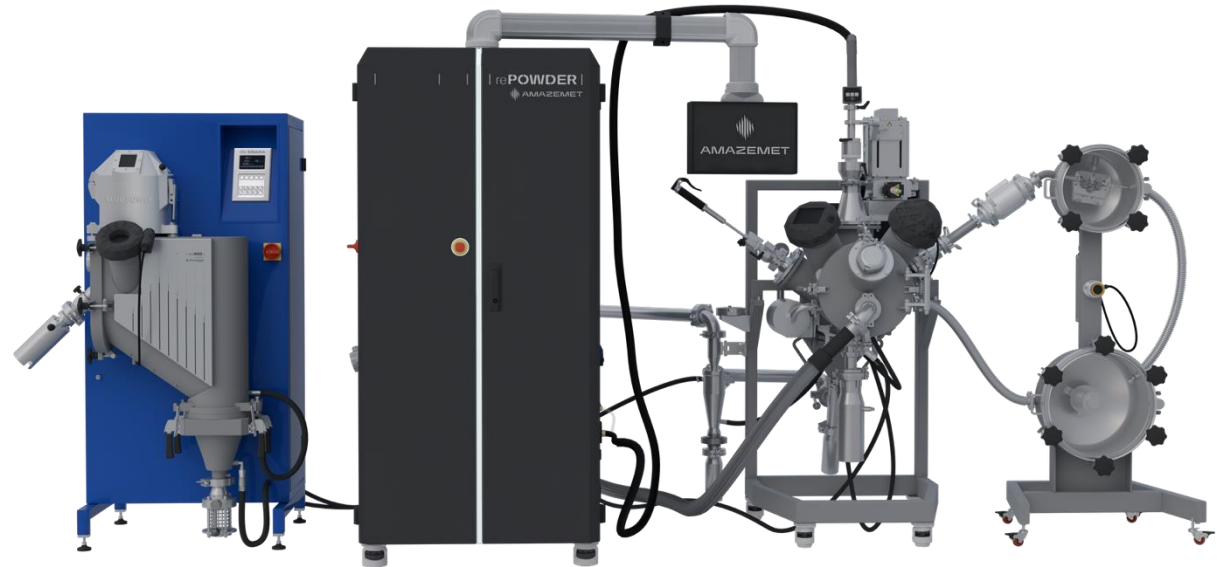
The European Defence Fund is the Commission's instrument to support collaborative Research and Development in defence. It is implemented through annual work programmes.

The **fifth** European Defence Fund (EDF) Work Programme addresses **33 topics** in total, organised around **7 thematic calls**, **2 non-thematic calls** and **2 specific grant agreements** in support of the Alliance for defence medical countermeasures.

# AMAZEMET – partner for desing and manufacturing

## Providing services:

- **Advanced manufacturing**
- **Industrial desing**
- **Big science projects**
- **Vacuum components**





THANK YOU!

**Łukasz Źrodowski**

**AMAZEMET, CEO**

**Carnegie Mellon University, Adjunct Profesor**

**Lukasz.zrodowski@amazemet.com**