

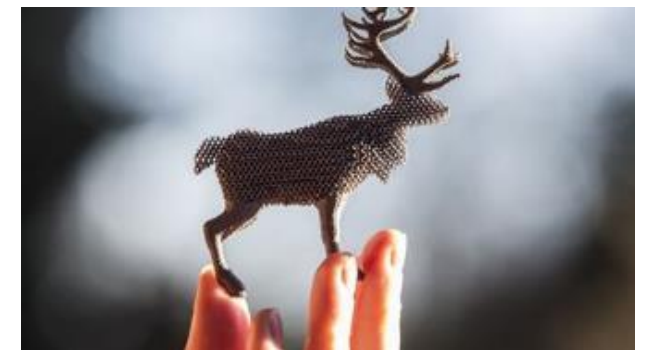


Products Optimization with New Additive Manufacturing Powders

Workshop on powder treatment and Alloys for 3D printing, Schwabisch Gmuend, 8th of May 2018

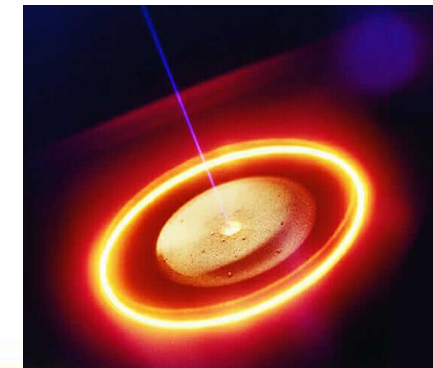
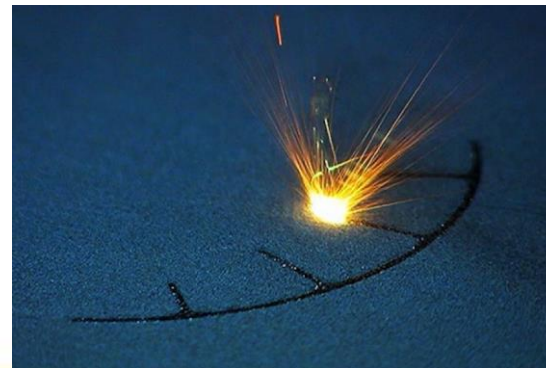
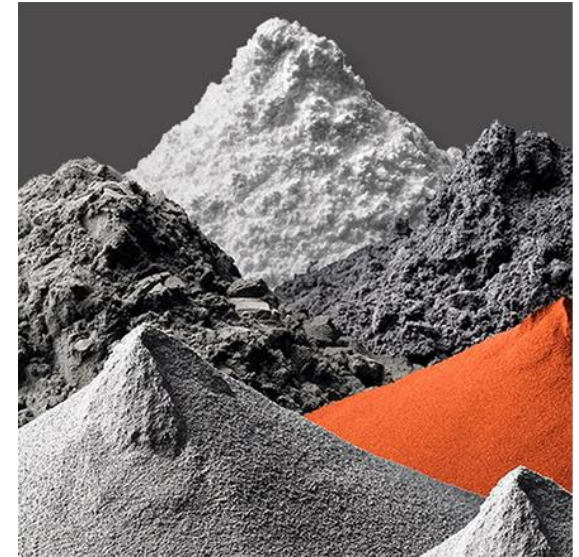
State of the art

- Benefits of AM processes
 - Complex shapes
 - Small series
 - Custom's made
 - Enhanced properties through the design
 - Lightweight
 - Reduction of assembly operation
 - Material distribution
- But at the other side of the coin
 - Quality of material and product strongly depends on:
 - Composition of raw material
 - Process conditions (microstructure created during shaping)



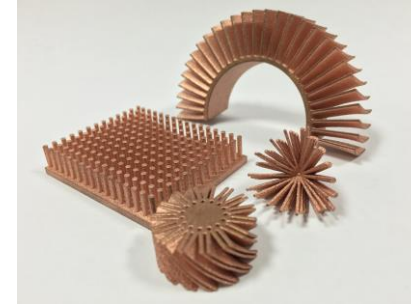
Motivation of the research project

- List of available materials for AM is limited
 - Constraints related to each process
 - Specific material properties incompatible with technologies
 - Material availability in the right form (powder size)
 - Small/niche market currently
- → New project “PONAMP” focuses on new metal materials for powder bed based AM
 - Laser Beam Melting
 - Electron Beam Melting



Objectives and scope

- Goal: improve coating techniques and investigate new material combinations for AM products with enhanced properties
 - Cu + Cu alloys
 - Increase T° resistance and mechanical properties
 - Maintain good electrical and thermal conductivities
 - LBM + EBM
 - → fields of application: electrical/electronic industry, heat exchangers, design-optimized functional parts, used of specific material properties
 - Al alloys
 - Development of high performance Al alloy
 - Mechanical properties in the range of 6000 and 7000 series
 - Coating to improve oxidation resistance and durability of the powder
 - LBM only
 - → fields of application: aeronautic and space, design-optimized functional parts, lightweight structural parts

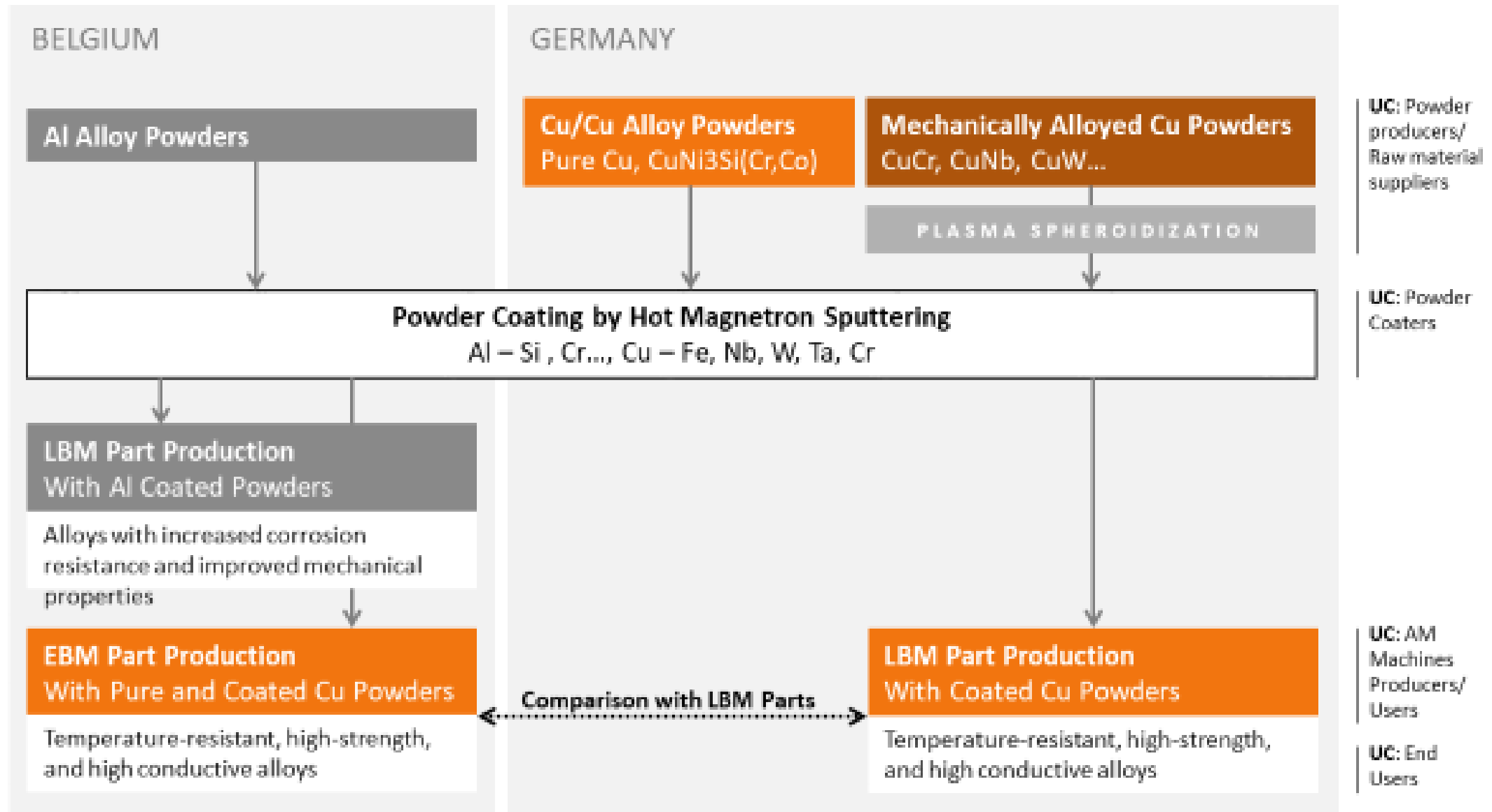


Partnership

- Same consortium of partners:
 - Forschungsinstitut edelmetalle + metallchemie (FEM)
 - Production and characterization of parts in Cu alloys by LBM
 - Fraunhofer UMSICHT
 - Preparation and surface treatment of powders
 - Materia Nova
 - Functionalization coating, plasma treatment of powders
 - Sirris
 - Production and characterization of parts in Cu by EBM
 - Production and characterization of parts in Al alloys by LBM



Organisation of the work



Co-operation with the industry

- Need for SME's for user's committee
 - Project orientation
 - Implementation strategy
 - Representative of value chain
 - powder production / plant construction
 - AM-machine provision
 - component fabrication
 - end-users
 - Provide case-studies
 - Give advice and feedback
 - Quick transfer of results in industry
- Users group meeting every 6 months

Thanks for your attention



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driving industry by technology



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