

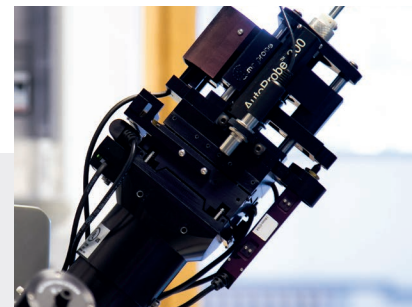
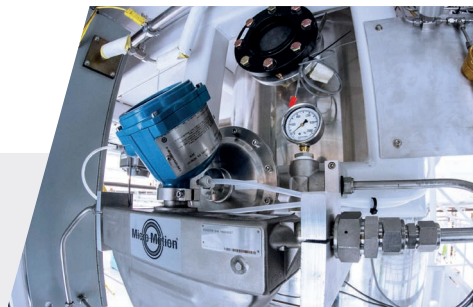


POWDER ATOMIZATION PILOT PLANT



EXPERIENCE & BACKGROUND

- Ceit is a research center affiliated to the University of Navarra whose mission is to improve the competitiveness of industry through applied research projects.
- More than 30 years in powder metallurgy: atomization, press and sinter, HIP, hard metals, diamond tools and additive manufacturing among other capabilities.
- Extensive equipment in materials characterization and testing.
- Hundreds of R&D projects combining basic research with technology transfer to powder metal industry under strict confidentiality.
- Doctoral theses and scientific publications.
- Experience with start-up companies including powder atomisation.



OUR R&D OFFER

- Customized special batches: starting from 1kg and up to 250 kg, with desired chemical composition and tailored Particle Size Distribution.
- Materials:
 - Fe-based: stainless, tool steels, maraging, ODS.
 - Ni-based: Inconel, Astrolloy, Haynes, etc.
 - Cu-based: bronze, brass, Cu-P, Cu-Cr-Zr, etc.
 - Co-based: biocompatible, MIM, superalloys, wear resistant (Stellite).
 - Joining: brazing, electrodes, soldering (Sn-based), etc.
 - Soft magnetic: FeNi, FeNiMo, FeCoV, FeSi, amorphous, magnetocaloric.
- Hard magnetic: NdFeB, SmCo, etc.
- Coatings.
- Back-up support for powder producers.
- Enhancement of production processes:
 - CFD simulation.
 - Test bench for nozzle analysis and validation.
 - Anti-satellite system development.
 - Consultancy and technical diagnosis.
 - Confidentiality.
- Laboratory services.



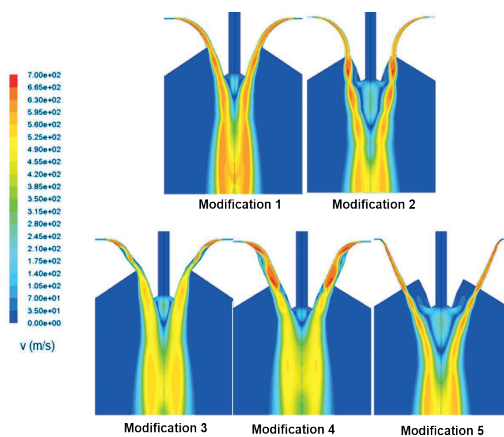
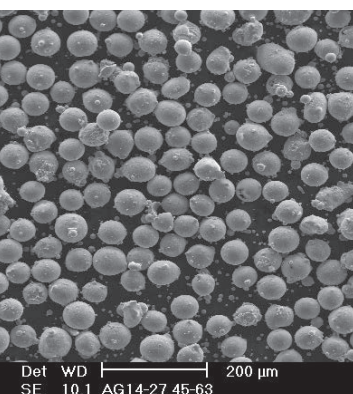
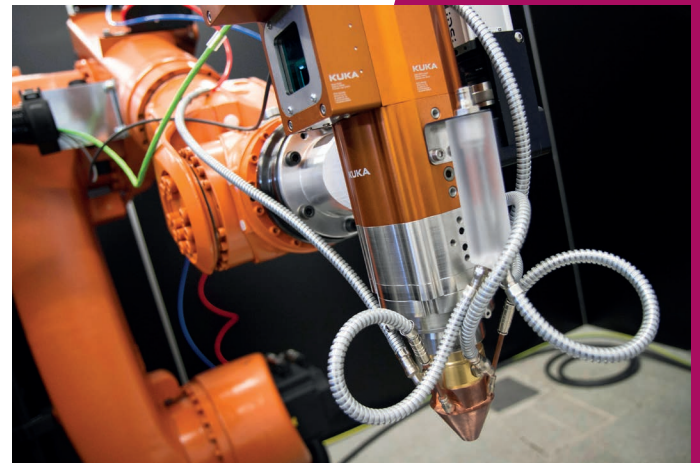
EQUIPMENT

- Atomising equipment.
 - Arcast ATM GP 200 gas atomizer: 30 - 250 kg batch. Gas preheating to 500°C.
 - PSI Hermiga 75/3 dual research gas/water (high pressure) atomiser: 3 kg batch.
 - Vacuum induction melting.
 - Atomising gases: Ar, N, He, air.
- Powder processing equipment. Every step in our powder processing is made under inert atmosphere to guarantee minimum contact with oxygen.

POWDER QUALITY

Powder characterisation analysis using our testing equipment:

- Particle size distribution.
- Flowability.
- Density.
- Internal Porosity.
- Chemical analysis: ICP and LECOS.
- Morphological and Microstructural characterization:
 - SEM, TEM, OM, FIB and AFM.
- X-Ray Diffractometry.



COMPLEMENTARY CAPABILITIES

- HIP processing of samples.
- HIP modelling.
- LMD processing.
- Design of components to be manufactured with AM techniques.