Combinatorial Metallurgy (COMET)

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MACH1 COMET
Materials Advanced Characterisation Centre

Using Combinatorial Metallurgy, Rapid Alloy Prototyping and Computer Simulation to develop the next generation of alloys for industrial applications and 3D printing.

Summary

The MACH1 COMET project is a collaboration between Swansea University and:

- Seven industries supplying advanced materials with a manufacturing base in Wales (ranging from Tier 1 anchor and regionally important companies through to a Tier 3 SME (Small to Medium Enterprise)
- A global engineering software company
- Two advisory partners specialising in the commercialisation of research

The collaborative effort of the project is to jointly develop:

- Rapid Alloy Prototyping capabilities (primarily driven by Cogent/Tata)
- Powder metallurgical and additive manufacturing capabilities (primarily driven by Sandvik-Osprey/Kennametal/Lase/Renishaw)
- The necessary computational simulation models for all processes (Kennametal/DSTL/ESI Group)

During the project new alloys will be developed by rapid alloy prototyping, with applications ranging from new highly-efficient electro-magnetic steels to new metal powder alloys for additive manufacturing and spark plasma synthesis. This will result in ultra-hard materials used in a wide range of defence, energy and aerospace applications. It is all underpinned in a first instance by the ability to synthesise from elemental powder combinations in a high throughput manner.

Aims

- To accelerate the collaborative discovery and commercial deployment of new materials
- To increase commercialisation of University-based research through greater acceptance of three research methodologies: Rapid Alloy Prototyping, Metal Powder Development and Process Computational Simulation
- To jointly develop and grow key common RD&I capabilities with the Industrial partners for accelerated material discovery, which dovetail into their own RD&I process
- To apply innovative collaboration to create process-specific alloys with demonstrated applications that meet market demands, including novel high entropy alloys and composites
- To deploy the developed RD&I capabilities for the future benefit of the partners and wider Welsh industry, creating a great competitive advantage which will lead to the creation and safeguarding of jobs

Funders

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Llywodraeth Cynulliad Cymru
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Find out more

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