



Capability Statement

Advanced Alloys

About us

The Advanced Alloys group at Deakin University's Institute for Frontier Materials (IFM) combines world-leading research in the development of new high-performance alloys, metal forming processes and lightweight design initiatives.

Our research is leading to development of high-performance materials with extraordinary properties, as well as the re-design of materials for a circular economy. We have a strong focus on developing greener materials and more sustainable technologies for the metals industry of the future.

As well as traditional techniques, our research also incorporates cutting-edge technologies such as artificial intelligence and machine learning to rapidly predict and optimise the extremely complex and multi-faceted system that is alloy and process design.

Our team is highly multi-disciplinary, consisting of metallurgists, engineers, physicists, biologists and data scientists, combining thought-processes from a wide range of specialties to develop new materials and engineering solutions.

Core Competencies

Alloy design

The IFM alloy design group combines a knowledge of fundamental metallurgy with advanced characterization and processing techniques in the design of new and enhanced alloys. Our research includes ultrahigh-strength steels, wear resistant materials for the mining sector, advanced lightweight magnesium and aluminium extrusion alloys and upcycled titanium made from scrap.

Metals forming

The IFM metals forming group focuses on developing advanced material models and innovative and flexible manufacturing technologies for the forming of current and future sheet materials.

Lightweight design

The lightweight design team uses research in advanced material and process development, material characterisation and modelling to establish advanced and low-cost lightweight structural solutions for the automotive sector.

Differentiators

Focus on developing materials for a circular economy

One of our primary research pillars is the development of alloys and metals repurposing, processing and recycling technologies with a circular philosophy. Our goal is the re-design of traditional alloys and processes to create products with multi-life functionality and retained value over multiple life cycles.

Breadth of scale

Our state of the art facilities and laboratories allow us to process and characterize metals across a vast range of scale lengths, from manipulation of elements at the atomic level to the production and assessment of industrial sized castings and wrought products.

Research Leaders

Professor Matthew Barnett,

Director, Institute for Frontier Materials

Associate Professor Daniel Fabijanic

Associate Professor (Research)