AFRC

ADVANCED FORMING RESEARCH CENTRE

UNIVERSITY OF STRATHCLYDE

University of Strathclyde Glasgow

MANUFACTURING INNOVATION: DEMONSTRATED, VALIDATED, DELIVERED.

www.afrc.org.uk

About the AFRC

The University of Strathclyde's Advanced Forming Research Centre (AFRC) is a globally-recognised centre of excellence in innovative manufacturing technologies, engineering research and development, and metal forming and forging research.

For almost a decade the centre has been at the heart of manufacturing research in Scotland. It is the only High Value Manufacturing Catapult centre in the country, one of only 7 in the UK making it the critical link between manufacturers in Scotland and the rest of this world-class network of manufacturing innovation and expertise.

The AFRC helps to fill the gap between fundamental academic research and industry. We help companies to turn innovative technologies and ideas into a commercial reality that will increase their competitiveness, boost their business and secure the manufacturing sector in Scotland and the UK for generations to come.

We offer world-class expertise and cutting-edge technologies that help firms develop solutions that bring about real business benefits for companies of all sizes from across the UK and internationally.

- £60m facility established in 2009
- £38.5 million project portfolio
- Over 400 projects; 331 with industrial clients
- 5,680m2 research space

What makes the AFRC different?

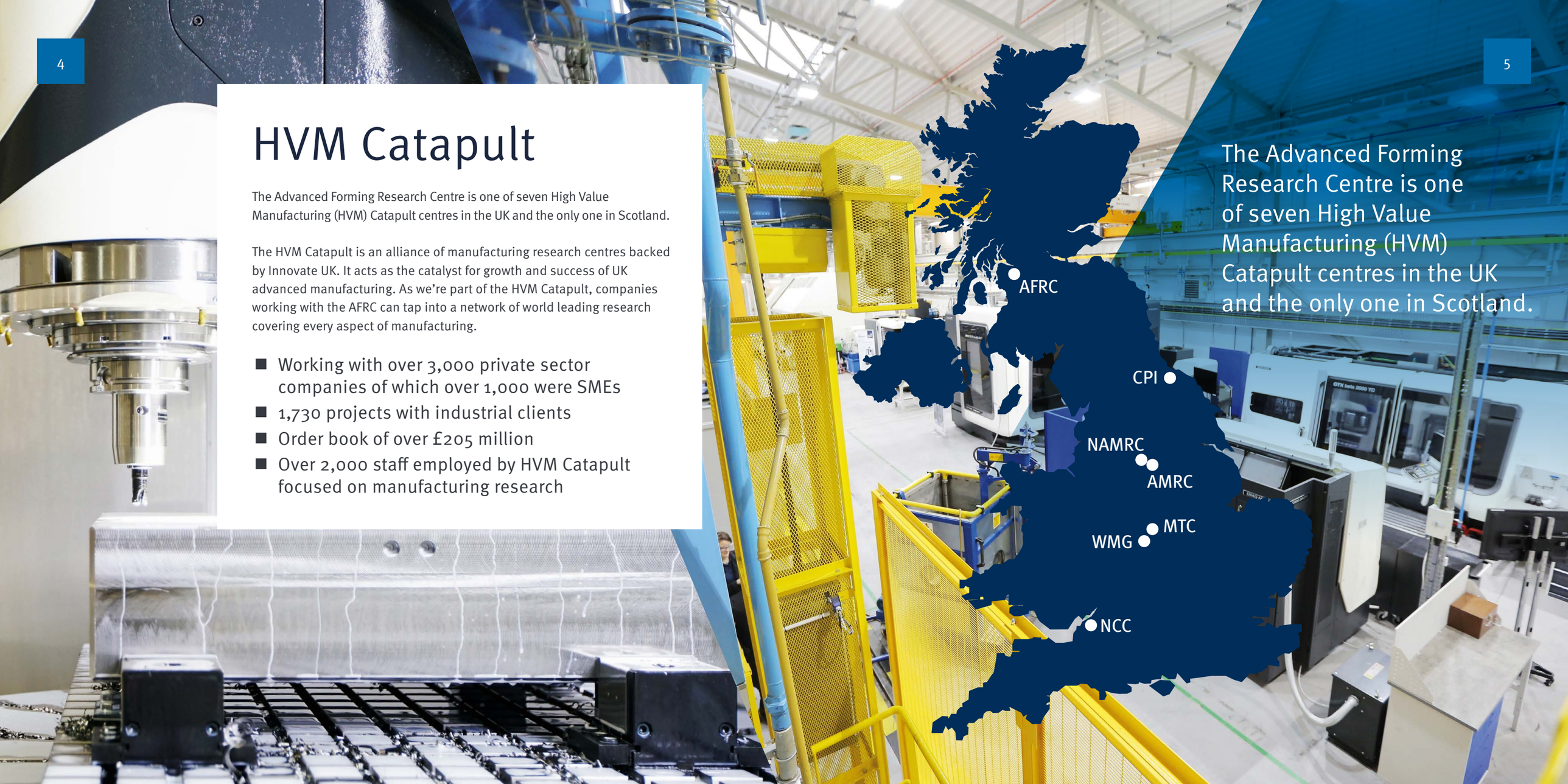
The AFRC is a research centre that thinks like a business. The people here have worked in industry. They understand targets, financial pressures, deadlines and budgets and work accordingly.

HVM Catapult

The Advanced Forming Research Centre is one of seven High Value Manufacturing (HVM) Catapult centres in the UK and the only one in Scotland.

The HVM Catapult is an alliance of manufacturing research centres backed by Innovate UK. It acts as the catalyst for growth and success of UK advanced manufacturing. As we're part of the HVM Catapult, companies working with the AFRC can tap into a network of world leading research covering every aspect of manufacturing.

- Working with over 3,000 private sector companies of which over 1,000 were SMEs
- 1,730 projects with industrial clients
- Order book of over £205 million
- Over 2,000 staff employed by HVM Catapult focused on manufacturing research



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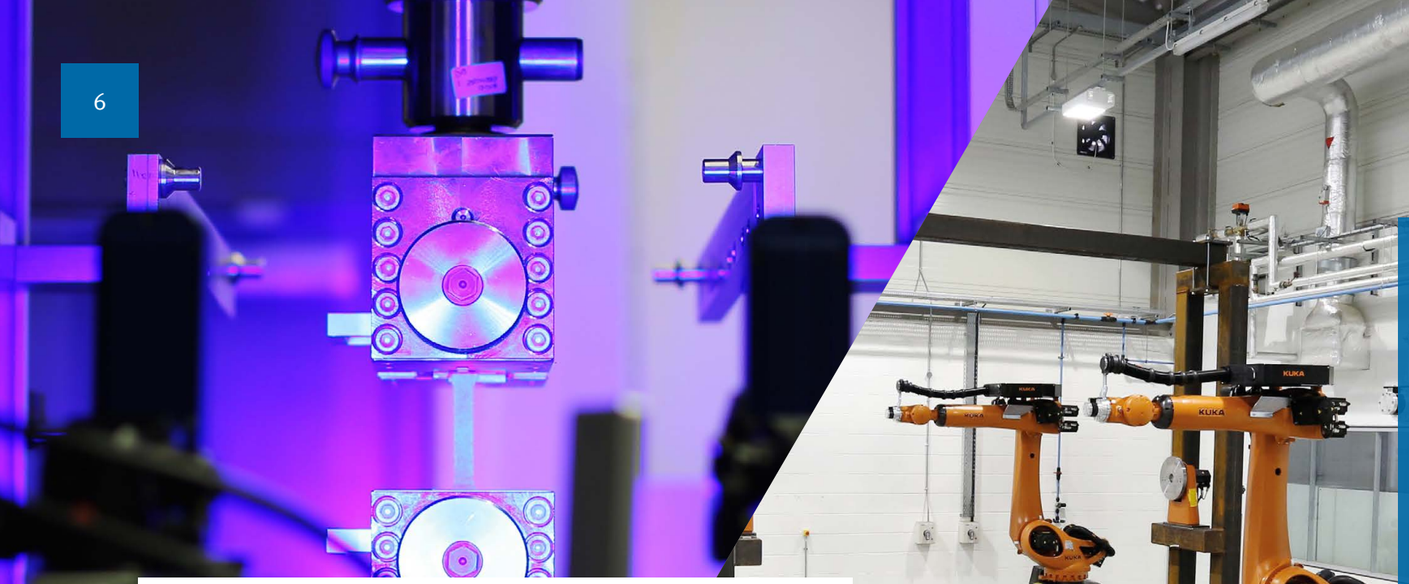

Our capabilities

The Advanced Forming Research Centre's focus is to build and develop capabilities that help businesses overcome manufacturing challenges and become more competitive. By taking a structured approach to innovation, the AFRC helps customers de-risk and accelerate the introduction of new technologies, materials and processes.

The centre's work can cover an entire product development cycle – from testing and characterisation to material and product assessment.

Capabilities

High integrity forging and thermal processing
For high value applications the main purpose of forging and thermal processing is to transform the underlying strength, life and behaviour of high strength metals used in the toughest of applications. The AFRC's expertise helps product designers and manufacturing engineers make critical choices about material and process selection.

Materials evolution, component resilience, and residual stress
A vital part of delivering validated solutions is understanding the effect of manufacturing processes on products. Not just the visible aspects like dimensional accuracy, but also underlying integrity. Our ability to characterise behaviour under complex conditions, our expertise in understanding resultant microstructure, and our focus on residual stress show how we deliver process technology which generates more resilient materials, components and products.

Near net shape design and make
We aim to help customers who want to make informed decisions about how to make their current and future products, and the design implications of those manufacturing decisions. Our methodology naturally favours solutions that make use of low energy, material efficient process routes such as cold forming, as well as breaking some of the stereotype views that exist around tooling cost as a barrier to entry for certain process / product combinations.

Sheet processing technology
Our expertise in sheet metal processing is complementary to our developing expertise in non-metallic materials including composites. Our capabilities in incremental sheet forming provide customers with cost effective complex shapes at a batch size of one. Our expertise in superplastic forming opens up a route to highly complex and multi-sheet production. Our knowledge and expertise in conventional pressing provide a route to defect free, volume manufacture.

Digitalisation, technology planning of process and supply chains
The AFRC has embraced the challenge of digital manufacturing from a pragmatic perspective which addresses issues in established and traditional supply chains. As well as new state-of-the-art facilities, we have developed in-house expertise in automation, measurement, sensing and visualisation. We use this enhanced capability as the basis for improving our customers' facilities.

The Advanced Forming Research Centre is led by its industrial members and partners. Both our governing and technical boards are made up of representatives from these companies.

Our members and partners come from across the manufacturing sector - and the globe. They vary in industry, specialism and size; from SMEs to global engineering giants.

Members & partners

Tier one founding members

The AFRC was set up in 2009 with the support of its founding members: Boeing, Rolls-Royce and Timet. These companies remain fundamental in setting the research direction of the centre and play a key role in the AFRC's success.

Tier one partners

Our tier one partners support the AFRC through in-kind donations such as new equipment, machinery and software. They work closely with the centre building strong working relationships with the AFRC community.

Tier one partners include: DMG Mori, Virtalis and Standex Engineering Technologies Group.

Tier one members

Along with the centre's founding members, the tier one members invest directly into the AFRC's core research programme. They define the direction of this programme, work collaboratively and share all resulting intellectual property. Tier one members include Aubert & Duval and Bifrangi.

Tier two members

Our tier two members are supply chain partners that provide the centre with capability that supports current and future research programmes. Our tier two members range from local smaller sized businesses to multi-national organisations.

“Working with the AFRC has provided us with valuable data on how we can be more energy efficient with our heat treatment processes and this is vital for our company as we strive to continuously improve.”

Derek Rae
Manufacturing Manager at Wyman-Gordon

“Near net shape & advanced forming processes are a very important element of the Rolls-Royce Advanced Manufacturing Strategy - our commitment to the AFRC gives us access to the very latest forming technologies and world class process specialists, helping us to deliver high productivity processes and new innovative products.”

Stephen M. Burgess
Director, Manufacturing Technology, Rolls-Royce

Who we work with

The team at the Advanced Forming Research Centre work with companies of all shapes and sizes from a variety of industries across the manufacturing sector.

The smallest business we have helped wasn’t even a business when we first met. It was one person, with one idea.

As well as businesses of different sizes, we’re happy to work with manufacturers from all different industries. What you make isn’t important to us, we’re interested in how you make it.

“The AFRC had the resources to help us on to the next level; the AFRC also provided us with the feedback and encouragement we needed to give us confidence in our product and our approach.”

Dave Wagner
Lead Engineer at A Step Ahead

“Mitsubishi is committed to engaging with all new and exciting processes, to this end the involvement with the AFRC is essential in helping us capture, and be involved in, the development of new technologies.”

Ian Brown
Area Sales Manager, Mitsubishi Materials

Working with the AFRC

Working with the Advanced Forming Research Centre gives you access to the leading skills, equipment and problem solving services offered by the centre.

Commercial projects

In our commercial projects the customer has complete control over the intellectual property generated from the project. The AFRC develops and works on commercial projects which result in effective and innovative manufacturing solutions that help our customers grow their business.

Collaborative research & development

The AFRC often works with companies that have great ideas for developing their businesses, but lack the necessary funds to achieve their aims. The centre can help companies access different funding opportunities and turn their ideas into commercially successful realities.

Membership & partnership

Membership and partnership of the centre is open to all companies from businesses involved in manufacturing and engineering, regardless of size or specialism.

Becoming a member or partner of the AFRC involves working collaboratively with other companies and having access to the centre's world-class research capabilities.

Membership and partnership agreements are bespoke to a company's needs. We will always ensure our members and partners get what they need from the centre.

Putting people at the heart of research

Our people are at the heart of our mission to bridge the gap between academic research and industry and deliver positive business outcomes.

From small beginnings in 2009 we have grown to a cadre of 130-strong highly-skilled engineers, researchers and business specialists today.

Any organisation with money can buy machinery and equipment but it's the people who operate it, carry out the research and execute the projects that make the fundamental difference.

“I work with some of the world's biggest manufacturing and engineering companies on industrial scale kit. No two days are ever the same and I'm constantly faced with new challenges. Not many people come into work smiling every day, but I do and this has a positive impact on my work.”

May Tuckwood
Manufacturing engineer

30%

of the team are non uk nationals

35% of this group are from eu nations

23 nationalities in total

34%
of the team is female including

24%
of our technical delivery teams

25% of the team is under the age of 30

Athena SWAN Bronze Award

As part of the Design Manufacture Engineering Management department the centre has been awarded the Athena Swan bronze award for advancing women's careers in science, technology, engineering, maths and medicine (STEMM) employment in higher education and research.

Developing future talent

Along with the Department of Design, Manufacture and Engineering Management (DMEM) within the University of Strathclyde's Faculty of Engineering, the AFRC set up the Advanced Manufacturing Industrial Doctorate Centre (AMIDC).

The centre offers Engineering Doctorates with a view to developing not only new and enhanced manufacturing techniques related to forming and forging of metallic materials but also the people who will be implementing and working with these techniques in the future.

The AMIDC's programmes offer companies and students alike the opportunity to undertake world leading research in manufacturing while working alongside globally renowned businesses. It offers companies a unique opportunity to work on advanced manufacturing production technologies with a dedicated researcher, the company has complete control over research practices undertaken. In conjunction with this it helps the students to develop their knowledge and abilities to understand manufacturing issues and allow them to gain industrial experience in order to communicate and implement viable engineering solutions.

It is this close partnership that will ensure industry has the right type of people it needs to bring about great success in the future.

Ambitions for the future

The AFRC and its people are ambitious.

We are dedicated to putting manufacturing, once again, at the heart of our economy. We are passionate about helping manufacturers of all sizes from all industries become more competitive and succeed in challenging markets.

Speak to us

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bsi. OHSAS 18001 Occupational Health and Safety Management

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Athena SWAN Bronze Award

CATAPULT High Value Manufacturing