A step-change in **Advanced Ceramics Innovation**
to drive Midlands industries
and the UK advanced manufacturing sector
Why Advanced Ceramics?

Often unseen, Advanced Ceramics has a global market predicted to be US$80 billion by 2022 and growing at 10% per annum. It provides products and services to an increasing and important range of advanced manufacturing industries and their supply chains, including: automotive, aerospace, healthcare, power and energy, space exploration, defence, telecommunications.

With their wide ranging properties and behaviours (electrical, electronic, magnetic, optical, mechanical, thermal) Advanced Ceramics are vital components in often hidden, specialist or harsh environments. They are essential in unlocking performance in a wide range of high-tech products, for example in: jet engines, fuel cells, batteries, automotive brakes, mobile telephony, and medical devices.

Advanced Ceramics are critical to increase the competitiveness of key high-value advanced manufacturing industries in the Midlands and vital to the nation’s economic recovery and self-sufficiency.

But, there are challenges...

- Advanced ceramics are expensive materials to research and develop
- The science is often complicated, necessitating a multi-partner approach
- Innovation at the company level can incur significant investment in time and capital equipment
- There is a lack of cross-industry technology transfer
- Scale-up and commercialisation of innovation is often slow

The MICG addresses these challenges

The Midlands has always been a global leader in ceramic design, cutting edge product development with global research organisations and innovative manufacturing technology, so it is ideally placed to tackle these challenges. Through the collaboration of the MICG partners, the researcher, manufacturer, and end-user will be connected, enabling effective problem-solving, ‘de-risking’ of innovation and faster commercialisation - leading to regional and national growth.

The strengthening of Midlands supply chains will ‘de-risk’ innovation, allowing organisations to manufacture new products and technologies speedily.

The result will be that the advanced manufacturing sector in the region will have a mechanism to reduce costs and enhance performance, making them more competitive on a national and international level.
Initial Progress

The consortium has already made much progress including targeted research work packages to meet the needs of the industrial members, an economic development activity plan and a skills and education plan, as well as investment cases for public and private investment.

MICG’s Ambition

We intend to provide a focus for growth in the Midlands via an Advanced Ceramics Campus in North Staffordshire to further enhance our Midlands capability. This will be conveniently situated on the Ceramic Valley Enterprise Zone. Negotiations are underway with significant relevant partners.

This focus will lead to the following benefits:

**REGENERATION** - the campus will make a major contribution to the region’s economic growth and make the area the hub of advanced materials technology

**INCREASE IN PRODUCTIVITY** - the productivity of UK manufacturing will be increased through the rapid commercialisation of new processes and technologies across the Midlands

**JOBS** - hundreds of new technical jobs of higher GVA with the potential for further growth will be created in the region

**INWARD INVESTMENT** - cost-effective manufacturing regions for advanced ceramics are attracting global interest. The Advanced Ceramics Campus will be a magnet for new and high technology businesses requiring advanced materials and commercialisation expertise

**COMPETITIVENESS** - The MICG initiative and Advanced Ceramics Campus will enable UK manufacturers to develop and commercialise products and processes that keep them ahead of global competition

**ADVANCED CERAMICS IS A HIGH VALUE MARKET** and will be a business area where the UK can compete nationally and internationally against other high cost competitors like Japan, Korea, and the United States.

And... Future Skills for Future Talent

Developing highly skilled material scientists, with dedicated business and commercial knowledge as well as hands-on practical industrial experience and technical expertise, will be at the heart of how the MICG will help companies reach new heights of commercial development and growth.

To that end, the MICG has already developed a degree level apprenticeship programme to plug the vocational skills gap identified by manufacturers in need of a skilled workforce going forward. The new Degree Apprenticeship in Materials Science, recently ratified by the Institute for Apprenticeships and Technical Education, is just one of the MICG’s many initiatives to gain traction in our materials science related ambitions.
The MICG

We are a unique consortium of industrial and academic stakeholders working together to accelerate the R&D, technology adoption and development of advanced ceramics in the Midlands, leading to increased advanced manufacturing production and exports of advanced ceramic products. Members include Rolls Royce (chair of the MICG), JCB, Morgan Advanced Materials, Vesuvius, Precision Ceramics, Prince Minerals, AEON Engineering, Trelleborg, Lucideon, AMRICC, CDS Group, the University of Birmingham, the University of Leicester and Loughborough University.

OUR AIMS

Make the Midlands the go-to location for the global R&D and production of advanced ceramics.

Increase the competitiveness of the Midlands industrial base and rapidly grow UK exports of advanced ceramics.

Solve critical challenges facing the Midlands region in terms of product development for next generation batteries, 5G electronics, and new healthcare devices.

Enhance industrial ability to develop innovative ceramic technologies with faster scale-up and marketplace adoption.

Deliver a multi-sectoral approach with rapid translation of new technologies for the advantage of a whole range of industrial sectors.

Strengthen the UK advanced ceramics supply chain for the benefit of the Midlands advanced manufacturing sector.

Deliver inclusive growth in the Midlands region: increased high skill jobs, education, and training - social and economic multiplier effects - increased GVA.

www.micg.org.uk