

ADVANCED MANUFACTURING



At the University of Birmingham we are pioneering new technologies in manufacturing in order to fast track innovation in rail, automotive and air travel which will help to support the UK manufacturing sector, drive the economy, deliver enhanced passenger safety and comfort, and reduce environmental impact.

Our key areas of research cover:

- Advanced materials engineering
- Engines for the future
- Automotive radar

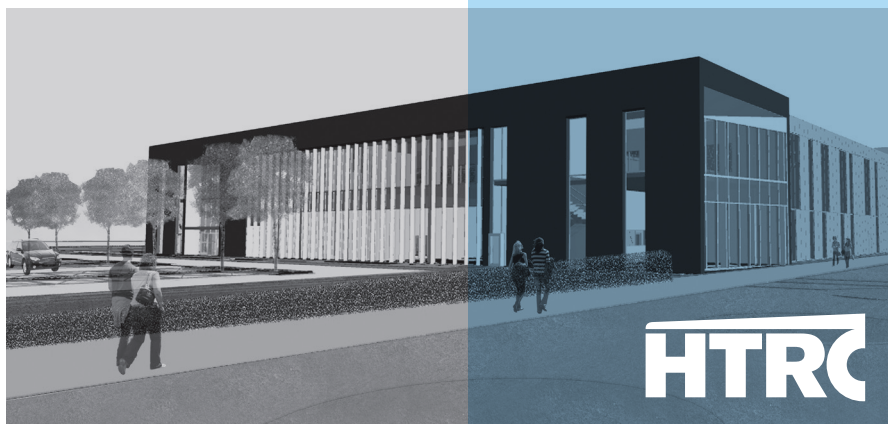
Key messages

- We work in partnership with industry to drive advances in the rail, automotive, defence and aerospace sectors, including novel materials and fabrication methods for aero-engines.
- We are developing engines of the future and designing tomorrow's railways.
- Our expertise underpins some of the most advanced engine designs.
- We are pioneering research into new materials and production processes for aircraft components, and minimising energy use in manufacture while reducing overall weight.

- We have an unrivalled history in the development of radar and our automotive radar research has helped to improve vehicle efficiency, capability and road user safety.
- Our communications engineers have been involved in the research and development of 'adaptive cruise control' and 'blind spot monitoring'. Both are now integral to the Jaguar Land Rover range.

OUR LABORATORIES FOR MATERIALS RESEARCH ARE AMONG THE BEST EQUIPPED IN THE COUNTRY AND WE ARE SHORTLY OPENING A

**£60
MILLION
HIGH TEMPERATURE
RESEARCH CENTRE
AT ANSTY, COVENTRY,
WHICH SPECIALISES
IN CASTING TECHNOLOGIES.**



The evidence

- In collaboration with Rolls-Royce we have established the £60 million High Temperature Research Centre (HTRC). This is a unique casting, design, simulation and advanced manufacturing research facility. It will focus initially on the key design and manufacturing aspects of investment casting in relation to aerospace and other industrial sectors.
- We work with industry to provide internships and business-driven research projects for undergraduate and postgraduate students. We have a range of industry-focused doctoral training centres across a variety of engineering subjects, including materials processing, materials characterisation, new materials development, structural integrity, materials modelling, hydrogen fuel cells and formulation engineering.
- We are working with Jaguar Land Rover to improve current and future engine technology, as well as next-generation gasoline direct injection combustion technology.

**THE UNIVERSITY IS A KEY
FOUNDING PARTNER IN THE
DEVELOPMENT OF THE £40
MILLION MANUFACTURING
TECHNOLOGY CENTRE (MTC)
CO-LOCATED ALONGSIDE THE HTRC.**



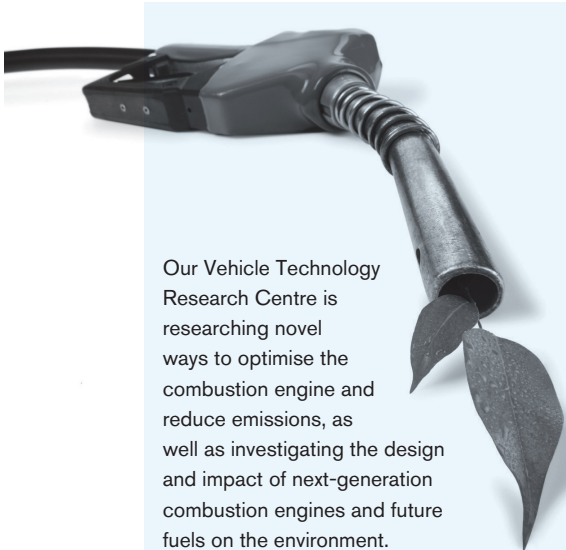
Case studies

The Manufacturing Technology Centre carries out leading research focusing on high-value manufacturing and the associated knowledge-based technologies such as laser processing, automation and intelligent manufacturing, non-conventional and advanced machining, and computer-aided engineering.



OUR NETSHAPE CENTRE HAS HELPED US FORM STRATEGIC PARTNERSHIPS WITH MULTINATIONAL COMPANIES INVOLVED IN THE DESIGN AND BUILD OF NEXT-GENERATION ENGINES AND AIR-FRAMES.

Our Vehicle Technology Research Centre is researching novel ways to optimise the combustion engine and reduce emissions, as well as investigating the design and impact of next-generation combustion engines and future fuels on the environment.



We are experts in the advanced manufacturing of micromachined THz waveguides, antennas and metamaterials, applied not only to automotive radar but to future generation communication systems and military radars.

