



High Temperature Materials

The drive for improvements in the environmental performance of aeroengines requires the development, characterisation and processing of new materials. For power plants the key drivers are:

- Increased operating temperatures and efficiency
- Improved reliability and availability
- Reduced unit and operating costs

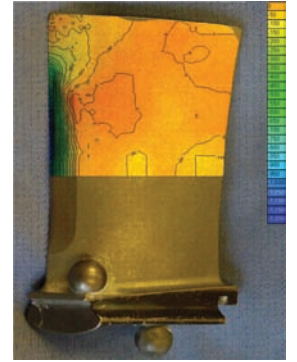
The School of Materials is making a major contribution in these areas with particular emphasis on:

- Advanced friction joining
- Ti-SiC fibre composites
- Laser peening and low plasticity burnishing/deep rolling
- Advanced microstructural characterisation
- Laser peening
- Residual stress and microstructural development during welding
- Intermetallics
- Thermal barrier coatings
- Deformation mechanisms of titanium and nickel-base superalloys
- Texture evolution during processing of titanium alloys
- Laser peening and machining stresses
- Residual stresses in forgings

- Helped support Rolls-Royce to introduce linear and inertia friction welding
- Engine manufacture supported by UKAS accredited stress measurements

Research areas

This multi-disciplinary area exploits the full breadth of the School of Materials with work on alloy development, microstructure optimisation by process control, microstructural characterisation, weld process development, the monitoring of thermal barrier coatings and the protection of materials from corrosion, erosion corrosion and wear at high temperatures. Our experience spans Ni-base superalloys, Ti alloys, intermetallics and ceramics. Use of realistic test and simulation facilities with electro-optical, surface analytical probing combined with access to the image facilities of the Unit for Stress and Damage Characterisation has allowed scientific development of materials for extreme environments.



Research facilities

- X-ray stress measurement facility
- Unit for Stress and Damage Characterisation
- High temperature testing capability
- World class microstructural characterisation site

Relevant postgraduate study

MSc in Corrosion Control Engineering

This Masters programme provides you with a thorough grounding in corrosion and its control. You will explore principles, protection strategies, and industrial applications, preparing you for either a career in industry as a corrosion scientist or engineer, or for cutting edge academic research.

Research degrees

Student research degrees in metallic materials are based within a vibrant research group, which is one of the largest in the UK. The research encompasses all aspects of metals, alloys and composites, including their design, processing, forming, joining and performance.

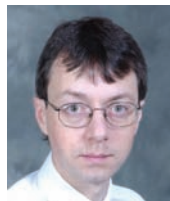
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