



Project Part-Financed  
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News item

### **Mercury Centre for Innovative Materials and Manufacturing**

Emerging processes for powder-based near net shape manufacturing of advanced engineering components offer lower costs and improved product sophistication. Near net shape manufacturing, whereby components with complex shapes are created directly, offers benefits including fewer process steps, lower environmental impact, and reduced cost at the same time as improved product quality. Recent developments in the technology now allow it to be applied across a wider range of industrial sectors and are mirrored by the increasing availability of production-scale equipment and the range of bulk powder feed-stocks. Commercial deployment is already benefiting a number of early-adopters amongst Yorkshire and Humber Region's advanced manufacturing cluster.

Like all new processing technologies industrial deployment generally requires substantial development activity to identify the composition and processing conditions required for a new product or new application. The University of Sheffield, in dialogue with Regional advanced manufacturing companies, has created a £10M development centre to accelerate the deployment of a range of powder-based manufacturing processes, within the Mercury Centre.

Mercury is part financed by Europe, attracting over £5M of investment from the European Regional Development Fund, as part of Europe's support for the region's economic development through the Yorkshire and Humber ERDF Programme 2007-13. This European investment in Mercury is enabling industry to secure a globally leading position by faster time to market for new sectors.

Professor Mike Hounslow, Pro-Vice-Chancellor for Engineering at the University commented, "The University of Sheffield works extensively with the advanced manufacturing sector and the Faculty of Engineering is recognised for our international excellence in research on engineering materials. We have a wealth of capability and facilities relevant to the exciting developments in powder-based manufacturing. By combining these with the innovative drive of the advanced manufacturing companies Mercury Centre is accelerating the manufacture of advanced components across a range of sectors including advanced manufacturing, energy, health-care devices and electronics."

Centre Directors Professor Mark Rainforth and Dr Iain Todd explained, "The creation of the centre arises from the global developments in powder-based manufacturing and demand for more sophisticated products made with radically improved resource-efficiency. Powder-based manufacturing encompasses a range of new processes such as high-speed sintering, additive-layer, and entrained-jet manufacturing. Initial equipment includes Additive Layer Manufacture, Deep Repair, Aerosol Jet Deposition, Spark Plasma Sintering, Metal Injection Moulding and Advanced Materials Characterisation. These processes, used for the manufacture, enhancement, or repair of components, address the need for components with more sophisticated functionality, such as mechanical properties, or biological or electronic surface functionality, plus a step-change in environmental performance."

The powder-based processes draw upon a common suite of engineering capabilities and developments. Bringing them together de-risks and accelerates the industrial development process. The Centre combines production-scale manufacturing equipment with a powerful suite of analytical facilities to understand the development, including world-leading electron microscopy. The processes are able to work with a spectrum of materials: including advanced metals, ceramics, functionally graded materials, electronic materials, polymers and biomaterials. This importantly allows the centre to work across different industrial sectors, accelerating the deployments by transferring experience from one sector to another."

## Notes for Editors:

Mercury Centre combines and builds upon the services offered to industry by the University's "Innovative Materials Processing Centre" (IMP-C) and "Sorby Nano Investigation Centre (SNIC)."

The Faculty of Engineering at the University of Sheffield is one of the largest in the UK. Its seven Departments include over 2,500 students and 700 staff and have research-related income worth more than £40M per annum from government, industry and charity sources. The 2008 Research Assessment Exercise confirmed that two thirds of their research was in the top two categories of Internationally Excellent or Internationally Leading. In the 2008 National Student Survey, 93% of graduates expressed satisfaction with their courses, placing the Faculty equal first in the UK. The faculty has a long tradition of working with industry as exemplified by the award-winning Advanced Manufacturing Research Centre (AMRC) and the new £25 million Nuclear Advanced Manufacturing Research Centre (NAMRC). To find out more, visit the link below.

### European Regional Development Fund

The European Regional Development Fund (ERDF) was set up in 1975 to stimulate economic development in less prosperous regions of the European Union (EU) and to act as a significant instrument with which the EU can support its Cohesion Policy. As EU membership has grown, ERDF has developed into a major instrument for helping to redress regional imbalances. The Department for Communities and Local Government (CLG) manages ERDF in England. Between 2007 and 2013, England benefits from an investment of EURO3.2 billion (approx £2.5Bn) of ERDF. It is delivered by regional programmes in each English region, managed by the Regional Development Agency. In Yorkshire and The Humber the EU allocated EURO583m of ERDF to invest by 2013. ERDF is directed at projects offering substantial benefits which meet the needs of an area and would not take place without a grant. It is used to provide help towards the project costs with grants set at a minimum level required to allow the project to go ahead. As a general rule, however, the EU contributes no more than 50% of the eligible cost with the rest of the funding, known as "match funding" coming from other public sources.

### For further information:

Mercury Centre – see [www.mercurycentre.com](http://www.mercurycentre.com)

Faculty of Engineering – sees [www.shef.ac.uk/faculty/engineering/](http://www.shef.ac.uk/faculty/engineering/)

ERDF in Yorkshire and Humber – see [www.yorkshire-forward.com/erdf](http://www.yorkshire-forward.com/erdf)

European Union's support for regional policy – see [www.ec.europa.eu/regional\\_policy/index\\_en.htm](http://www.ec.europa.eu/regional_policy/index_en.htm)