



Daresbury Science
& Innovation
Campus

Aerospace & Automotive

Shaping the Future of Science & Innovation

Daresbury Science & Innovation Campus (Daresbury SIC) is an internationally recognised location for hi-tech businesses and leading-edge science. It represents a fundamentally new approach to driving UK competitiveness in global science and innovation. The Campus was formed by the Northwest Regional Development Agency (NWDA), the Science & Technology Facilities Council (STFC), Halton Borough Council and the research intensive universities of Liverpool, Lancaster and Manchester.

Daresbury SIC provides a unique environment for innovation and business growth, offering major opportunities to the automotive and aerospace sectors for knowledge exchange and the development of collaborative activities.



Daresbury Science
& Innovation
Campus

A National Technology Pool

World-class, large scale research facilities, managed by STFC, are regularly accessed by the automotive and aerospace sectors through Daresbury Laboratory.

High profile users of these facilities have included Airbus and Rolls Royce, with the aerospace sector's keen focus on safety being paramount in the research. Rolls Royce, for example, has designed turbine blades with technology from the Daresbury Laboratory and, in the SME market, the combination of world class scientific expertise with hands-on technical and commercial support has helped turn many innovative concepts into reality.

Industry Focus

Daresbury SIC has a developing strategic relationship with the Northwest Aerospace Alliance (NWAA), the UK's premier aerospace cluster, representing 325 member companies in the Northwest and a further 850 affiliate members across the UK. Aerospace (with a turnover of around £6.5 billion) forms a major part of the Northwest's Advanced Engineering and Materials sector. The Campus is also developing strategic links with the Northwest Automotive Alliance (NAA) which provides a focal point for the region's £9bn automotive sector. These links make Daresbury SIC well placed to access technology and expertise from across the sectors, enabling cross sector innovation and increasing the interaction of companies with the region's Higher Education Institutions.

Technology Exchange

STFC offers a broad spectrum of technologies through a number of its leading research groups active in areas such as advanced materials, micro and nano technology, supercomputing and dynamic modelling. Exploitation of this technology is enabled through its knowledge transfer organisation, CLIK, which progresses individual projects through various business models to the point of implementation as commercial licenses or spin-out companies.



Advanced Manufacturing

From novel composites to electroactive polymers, there is a broad spectrum of technology expertise accessible to both the automotive and aerospace sectors through Daresbury SIC.

STFC's core strengths in synchrotron and neutron science have been used to address many critical manufacturing issues including the application of synchrotron x-rays to give accurate 3-D imaging of wing ribs. These capabilities also influence the development of novel processing technologies and new structural materials, and enable breakthroughs in other areas, such as novel joining methods, surface treatments, composite reinforcements, fatigue of welded aerospace components and crack propagation.

Another area of STFC's experience and expertise lies in novel materials, with a focus on composites, which has enabled it to develop extensive knowledge of novel material properties. This, along with research into the application of these material properties, carried out in partnership with a network of leading universities, has led to breakthroughs in areas such as wing surface materials technology. One of the key outcomes of this research is the potential for materials to be made ice-phobic, a major issue for the aerospace industry.

Did you know?

STFC has measured residual stress within friction stir welds on an Airbus prototype wing rib.



Daresbury Science
& Innovation
Campus

New Frontiers in Aerospace

Growing areas for the Campus will be computational science, neutron science, imaging, space science, materials and detector technology. Large scale government investment has been announced to develop centres for a scientific step change and exchange of knowledge in these areas, offering major implications for the aerospace sector.

One of STFC's leading capabilities is supercomputing, a world class resource that enables it to carry out extremely complex aerodynamic modelling. This, along with its intelligent coding capability and advanced computational fluid dynamics (CFD), enables it to carry out immensely complex simulations. Whole aircraft simulations can now be performed in a fraction of the time taken previously allowing design improvements, product optimisation and significant savings in both time and money.

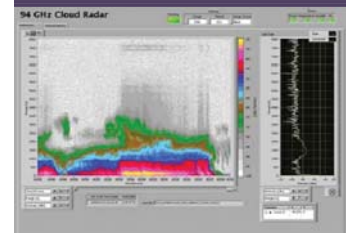
STFC also has a key strength in one area of neutron science, which underpins its research into avionics. This is a major issue for today's aircraft industry as the move to smaller and smaller circuitry has led to a growing problem of errors at altitude due

to increased levels of neutron bombardment, which STFC can both identify and rectify using micro-chip irradiation. It also provides expertise in the manufacture of novel temperature and pressure sensors for the aerospace industry which, due to their ultra high temperature and pressure capabilities, means they can be used in extreme conditions such as the combustion zone of jet engines.

Addressing the global energy challenge is another area where STFC is active. With oil sources dwindling and the possibility that hydrogen may become the fuel of the future, a key challenge is finding materials that can hold significant quantities of hydrogen. STFC's neutron source is already providing answers to questions such as this.

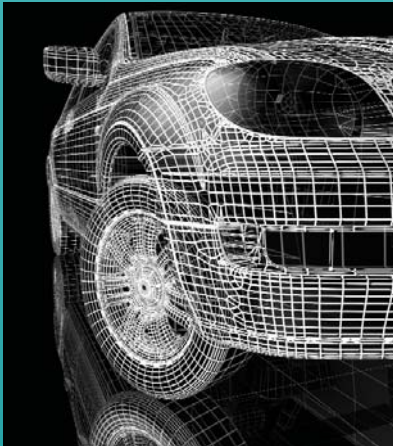
Did you know?

STFC has developed a cloud radar capable of assessing the altitude, thickness and quantity of cloud and fog layers.



Next Generation Automotive Technology

With climate change, the global economy and the resulting focus on fuel efficiency and emissions criteria, STFC is well placed to play a key role in developing the vehicles of the 21st century. Along with its extensive capabilities in aerodynamic modelling and fluid dynamics, STFC carries out research into areas such as engine management systems, materials and lubrication.



In engine management, STFC has developed complex computer models replicating typical combustion conditions, giving the automotive industry new insights into previously intractable and commercially important aspects of their business development programmes.

Understanding how materials behave under tension and compression, another of STFC's applied research areas, is an area where STFC applies its x-ray and neutron science expertise. Through this, it is able to help manufacturers explore the behaviour of component materials under strain, without cutting them, providing accurate high resolution information.

X-rays can also be used to examine the composition of specialist lubrication oils, enabling performance improvements to be made.

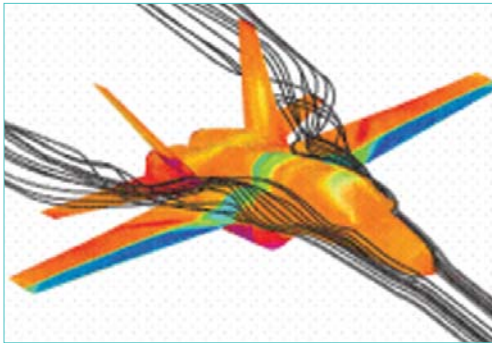
Indeed, most of STFC's core capabilities in the automotive and aerospace sectors result from the need to address real world problems that are impossible to solve through the manufacturer's own research and development programme. By working with STFC, manufacturers are able to explore innovative solutions from across the scientific spectrum, and in doing so enable them to respond to major environmental and economic pressures.



Daresbury Science
& Innovation
Campus

Prototyping & Testing Facilities

Through STFC the Campus draws project teams together to work on converting scientific concepts into marketable components, and has built up considerable experience in prototyping to enable this. This can lead to both the creation of spin-out businesses and to attracting businesses to locate on Campus. STFC also provides a facility for replicating the hostile environments faced by the aerospace industry including temperature, pressure and vibration testing.



Business at the Heart of Science

The Campus is home to a wide variety of hi-tech businesses, ranging from small start-ups to strategic units of large multi-national corporations. To date, the number of companies on the Campus is approaching 100, active in a number of different market sectors and attracted to the Campus by:

- A recognised research & development focussed environment with a dedicated STFC account manager and links to a wide network of research intensive universities
- Opportunities for technological and commercial collaboration and fast access to commercial and academic contacts through a hi-tech focussed ecosystem
- Excellent transportation links
- Strong regional, national and international networks
- A spacious rural location in Cheshire
- Tailored business support and connections to major funding streams

For further information please contact:

**Daresbury Science & Innovation Campus Ltd, Daresbury Innovation Centre,
Keckwick Lane, Daresbury, Cheshire WA4 4FS, United Kingdom**

General enquiries:

Tel: **+44 (0)1925 607000** Email: dsic@nwda.co.uk Fax: **+44 (0)1925 607398**

www.daresburysic.co.uk/sectors/auto-and-aero

Putting Business at the Heart of Science