Process engineering

The BioComposites Centre provides services and research facilities for the forest products industry. Commercial manager Dr Rob Elias outlines some of its work

The BioComposites Centre (BC) was established in 1989 by Dr James Bolton, a leading academic in the Wood Science Department at Bangor University. He had a vision to develop a centre of excellence that could link research to the needs of the forest products industry by providing easy access to expertise and facilities. It is perhaps as a testament to that vision that the BC continues this work today. During the ensuing years the BC has developed a reputation for pilot scale production and proved its capability by providing technical support for industry wishing to improve its manufacturing processes or develop new products.

The BC is a self-funding contract research institute with no teaching commitments. It has an annual turnover of £1m and is staffed by a team of researchers with expertise in industrial technology development.

In the early 1990s, work focused on the pilot scale development of technologies for MDF. At that time there was a great deal of interest in the use of alternative sources for fibre. Work investigated the potential of using a range of biomass fibres from straw, hemp and coppice wood. Other landmark research projects included the first studies on the mechanisms of blowline blending for MDF production. This work is still referenced by new studies and is used by research groups across the globe.

There was also a great deal of interest in the chemical treatment of wood fibres using processes such as acetylation to make wood hydrophobic and improve the dimensional stability of panel products. Specialist additive technologies were regularly studied to make panels fire retardant, improve their biological performance, enhance their mechanical properties or simply reduce the free formaldehyde content of the raw boards. In 1996 the BC recognised the need to ensure that European research could be easily disseminated to industry and the first European Panel Products Symposium was held that October. This conference celebrates its 10th anniversary on October 10-13, 2006.

Along with the changes seen in research topics the centre also has a new director, Dr Paul Fowler. Dr Fowler took on his role only two years ago but during that time the BC has seen some significant changes. The centre has relocated its research laboratories and is investing in a new offsite £550,000 pilot scale development. This includes the establishment of a pilot scale resource in a new 600m^2 industrial unit that is located just outside Bangor. Leading this project is the BC's research manager, Dr Mark Hughes, who is planning the commissioning of the new equipment.

"This has been an exciting and challenging time for the centre," said Dr Fowler. "We had to move lock, stock and barrel from our old building to new offices and research laboratories. Within a month we had moved our heavy equipment from the old building into storage while we found a new site for our pilot scale facilities.

The BioComposites Centre has developed a reputation for pilot scale production

"To realise this we successfully bid for funding to the Welsh Development Agency through a scheme called the Knowledge Exploitation Fund. This took some planning and a great deal of team work from all our staff," added Dr Fowler.

The centre has also taken the opportunity to review its business plan and objectives. Increasingly climate change and the growing demand for sustainable materials are driving R&D investment. To meet these requirements the centre is developing new programmes of work that include white biotechnology, the production of engineered wood products and biocomposite materials.

And the team is confident of new commercial opportunities, having seen increasing requests for sustainable technologies in many applications.

Current research projects include the development of new bioresins, wood preservation treatments and processes for waste MDF recovery. The centre is also developing the concept of biorefining of lignocellulosic materials. Bio-ethanol is seen as a way of decreasing the demand for fossil fuels, but the by-products generated also need to be considered and could result in new opportunities for the wood-based panel sector.

The centre is also a key partner in the recently established European Cost Action E49-Processes and Performance of Wood-Based Panels. The aim is to ensure that the sector remains competitive by stimulating investment through R&D across Europe. ■

SUMMARY

- The Bio-Composites Centre was established in 1989.
- Its annual European Panel Products Symposium celebrates its 10th anniversary next year.
- The centre is investing £550,000 in an offsite pilot scale development.
- Climate change and the demand for sustainable materials are driving R&D.