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Carbon nexus: opportunities for translational research in carbon fibres and composites.

Bronwyn Fox¹

¹ Institute for Frontier Materials, Deakin University, Waurn Ponds, Victoria 3216, Australia

Environmentally sustainable transport solutions for the future demand innovation in vehicle mass reduction to improve fuel efficiency and reduce CO₂ emissions. Carbon fibre composites, materials where carbon fibre is embedded in a polymer matrix, are a key element in helping realise these demands—as evidenced by the remarkable increase in the commercial applications of these materials as a substitution for heavier, traditional materials such as steel. For example, carbon fibre composites make up 50% of the structural materials of Boeing's Dreamliner passenger aircraft resulting in a 20% improvement in fuel economy. As a result of this increasing use, carbon fibre production is projected to more than treble in the next 10 years.

An Australian facility with the capacity to produce aerospace quality carbon fibre, Carbon Nexus (www.carbon.nexus.com.au) will facilitate world leading, industrially relevant research on all aspects of carbon fibre including structure-property relationships. Carbon Nexus represents a partnership between Deakin University and the Victorian Centre for Advanced Materials Manufacturing (VCAMM) and has been supported by both the Victorian State and Australian Federal Governments. It is the world's first university based multiscale carbon fibre research facility capable of producing industrially relevant, high quality fibre. Both a laboratory scale single tow line and a larger 20 ton pilot line will be capable of converting a range of precursors to carbon fibre and is due to be completed in June 2013. The research in this facility will build on Deakin and VCAMM's existing partnerships with companies such as Quickstep, Futuris, Boeing, Ford, Despatch and Furnace Engineering. Extensive consultation with the major industrial suppliers and end users of carbon fibre has led to the identification of the grand challenges to be solved by conducting targeted research. This presentation will describe the vision and research themes for Carbon Nexus, how the outcomes from this research will be translated to industry as well as highlighting opportunities for research collaboration.

Bronwyn Fox

Associate Professor

Deakin University, Geelong, Australia

Phone: +61 52271015 E-mail: Bronwyn.fox@deakin.edu.au

Personal History:

2006-10 Senior Lecturer, Deakin University

2002-6 Lecturer, Deakin University

Research interests: Carbon fibre, composites, nanocomposites.



