

carbonfibre

By David Adams

breakthrough could curb soaring petrol prices



Dr Bronwyn Fox doesn't really see herself as a 'rev-head' but she does acknowledge that her ground-breaking work in developing light-weight materials for the automotive industry has taken her where few women have previously been.

Bronwyn heads up Deakin University's composite team in the Advanced Materials Processing and Performance (AMPP) research unit.

'But engineering is also an occupation that is highly creative and imaginative and I'm very passionate about promoting it as a career to young women because there are some very exciting career opportunities for them,' Bronwyn says.

A chemistry graduate with a doctorate in aerospace composites, the Vespa-riding Bronwyn current project involves development of carbon fibre composition, a material that provides a light-weight, high-strength alternative to metal.

Used in the aircraft industry and Formula One racing cars for years, the material also has great appeal for the mass car market, particularly given its potential to counter rising petrol prices.

Bronwyn said carbon fibre was a third of the weight of steel. It was also 12 times as rigid and, when correctly designed, had an infinite fatigue life.

'The introduction of carbon fibre to automotive structure has the potential to reduce vehicle emissions and improve performance, as well as improving occupant safety,' she says.

'And if the weight of cars is reduced through the use of carbon fibre composites, there will be significant savings for us all at the petrol pump. With petrol prices rocketing upwards, I'm sure that alone would be enough to make it a popular choice of material.'

While there have been some prototypes made—Holden recently produced an HSV 427 Coupe prototype with a carbon fibre bonnet, for example—until now lengthy and costly production processes have prevented the material being widely adopted within the automotive industry.

Thanks to work at the AMPP research unit, however, that may soon change.

In their state-of-the-art facilities at Deakin's Geelong campus at Waurn Ponds, researchers have been working with world-first technology developed by Perth-based company Quickstep Technologies Pty Ltd to develop a process that will slash the cost and time needed to produce car components from composites.

In a process that uses fluid-filled bladders to cure the composites in a machine that resembles a giant sandwich toaster, they have significantly reduced the cost of producing the material and have slashed curing times from eight hours to as little as 20 minutes.

'By potentially lowering the manufacturing cost of structural and decorative carbon fibre, Quickstep could have a massive effect on the automotive industry as we know it,' Bronwyn says.

The composites project is also benefiting Deakin engineering students. Five postgraduate students are directly involved in the composites research, giving them exposure to key people in the automotive industry in both Australia and the US.

'My PhD students regularly present their work to visitors from industry and have excellent team and communication skills,' Bronwyn says.

'It is very different from my own, more common, experience as a postgraduate student of being shut away in a lab by myself, hoping that one day my results would see the light of day.'

Bronwyn said the ongoing contact between the University and industry figures fed back into the University's new Masters of Automotive Engineering course and ensured undergraduate students were exposed to the cutting edge of the industry.

'I'm able to highlight the problems that we are working on and the things that we are still trying to work out rather than listing facts. That really engages the students because they can see where they might be able to make a contribution.'