

Team looks at possibility of biodegradable cars

5 October 2010 | By Stephen Harris

Cars could one day become biodegradable using materials under development at Sheffield University.

Researchers are working with an oil palm fibre manufacturer to design a substance for building car body panels that are partly decomposable and partly recyclable, with the hope of then creating a material that could biodegrade completely.

The Sheffield team hopes to combine natural oil palm fibres, which are currently used in construction to prevent soil erosion, with synthetic resins to create a stiff, strong and waterproof substance.

'The technical difficulty is that these natural fibres don't normally like the synthetic matrix that we have but we have to bring them together by some sort of mechanical or chemical adhesion,' Dr Elaheh Ghassemieh at the Sheffield Polymer Centre told .

'At the same time natural fibres like moisture and, by absorption of moisture, they change their properties immensely so all of a sudden you will have a swollen composite with much reduced strength.'

The material will be designed so that the synthetic resin can be removed and recycled, leaving the fibre to degrade. Ghassemieh expects the material would need to last for at least eight years to be of use to car manufacturers.

Oil palm fibres are typically processed for industrial use so the researchers may go back and change this initial stage to make the fibres more suitable. In particular, the fibres degrade at a relatively low temperature, which limits the traditional processing options and quality of the product.

'The manufacturers of this fibre have never looked at what we want to do so they haven't processed it according to our needs,' said Ghassemieh.

The team hopes to have the part-recyclable material complete within three years, before moving onto the fully decomposable version that will use natural resins. Ghassemieh is also involved in research to develop biodegradable packaging from similar fibres.

'The fully biodegradable material is very ambitious because the natural resins that we've got at the moment don't have all the properties that are needed,' she said.

Interest in sustainable car manufacturing has increased over the last decade due to EU End of Life Vehicles (ELV) Directive, which requires manufacturers to cover all or most of the cost of all motor vehicle disposals.

Ghassemieh plans to approach manufacturers once the research is at a more advanced stage. 'Car manufacturers are one of the most resistant groups to change in terms of new materials so it's not going to be easy,' she said.

'I'm hoping that as the regulations become tighter it will force them to make the move. Consumer motivation is very small apart from among people who really care about the environment.'

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