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SCIENTISTS S-T-R-E-T-C-H TO RECYCLE CAR PARTS

British scientists have invented a radical new way of making cars greener - by making parts from plastics that have been given the stretch treatment!

During a two-year research programme they have cracked the problem of how to use special new plastics that are six times as strong as normal, yet are light and, vitally, 100 per cent recyclable.

Now it opens the door to a vast range of car, truck and van parts that can be made more simply and cheaply than conventionally manufactured components. And the ultra-strong, ultra-light parts will help lower exhaust emission levels and increase fuel economy.

But the biggest advantage of all - as stringent new laws require manufacturers to build vehicles that can be re-cycled - is that the new plastics can quickly, easily and cheaply be reduced to crumbs and then re-used.

The breakthrough was made by a consortium of engineers and scientists working on RECYCLE, a research programme under the Society of Motor Manufacturers and Traders Foresight Vehicle initiative.

They were looking at new ways of working with self-reinforced polypropylene (SrPP), which is much stronger than normal polymers. Ordinary polypropylene already has many advantages, but on its own it is not strong enough for many automotive uses. Normally it has to be reinforced with fibreglass, carbon fibre or natural materials, such as hemp, flax or sisal.

But adding in different materials makes recycling a complicated, time-consuming and expensive operation - ruling out all the other advantages of the useful plastic.

If panels made from polypropylene were simply made thicker, or strengthened with extra ribs, it would make the parts too heavy and again defeat the automotive industry's quest to find strong and light alternatives to metal components.



Self-reinforced polypropylene (SrPP) is made by stretching and aligning molecules within the plastic itself by a complex heating and weaving process. It gives what the scientists call high mechanical strength. But until now this new, much stronger material, has proved difficult to shape, join and paint for mass production.

But the SMMT Foresight Vehicle RECYCLE engineers have now overcome the problems and have perfected special techniques that will allow car makers and others to mass-produce parts using SrPP.

The scientists have already produced trial parts for the Lotus Elise sports car which are 57 per cent lighter than the conventional part. Lotus Engineering is one of the partners in the RECYCLE project.

Dr Brendon Weager, of Chesterfield-based firm NetComposites, was project manager on RECYCLE. He said: "Using this new material has a host of advantages. It will be easier and less expensive to mass-produce than other materials, because the tooling does not have to cope with high pressures or abrasive materials.

"The finish is much smoother than glass fibre reinforced plastics and it is safer to handle by human operators."

Now the major technical hurdles have been overcome, the scientists are working towards full production and several vehicle manufacturers are taking a keen interest.

There has also been a spin-off to other industries. The RECYCLE scientists are now looking at other applications of the light, strong and totally recyclable plastics. They can be used to make shin pads for footballers, body armour, helmets and even suitcases - all products that need strong, lightweight plastics that do not harm the environment when they come to the end of their product lives.

Other partners in the SMMT Foresight Vehicle RECYCLE programme are NetComposites, Propex Fabrics, Warwick University, BI Composites, Trauma-Lite and London Taxis International.

More than 400 UK companies and universities have been participating in the industry-backed Foresight Vehicle initiative, which is led by the Society of Motor Manufacturers and Traders (SMMT).

High-resolution J-peg images of the Lotus Elise are available on request.

Visit Foresight Vehicle on the web at www.foresightvehicle.org.uk