

Composites spring forward

Composite leaf springs, supplied by German composite producer IFC Composite, have substituted steel springs in the Mercedes-Benz Sprinter and new Volkswagen Crafter vans.

IFC Composite, established 10 years ago in the German town of Haldersleben, claims to be the world leader in composite leaf springs. It supplied 100,000 springs in 2006 and 220,000 in 2007 using know-how acquired from Darmstadt Technical University.

The leaf springs have been developed from concept to large series production within an 18-month period in co-operation with Benteler Automobiltechnik.

Dr Oliver Franke, from the lightweight engineering and design department at Darmstadt Technical University, says the parts provide a 60-80% weight saving (typically reducing part weight from 67kg to 17.5kg) and provide a four to five times improvement in lifetime compared to steel.

While the first large series production in Germany has involved smaller commercial vehicles, Franke says trials with rear axle GRP leaf springs on a 26 tonne truck – replacing three-layer steel units – have shown a lifetime of more than 20,000km under poor road conditions where steel lasted only

4,000km. GRP leaf springs also benefit from a gradual, rather than sudden failure.

It is also possible to design thicker GRP sections where greater strength is required, as well as sections with optimised fibre content to limit local fatigue, says IFC Composite technical manager Rainer Förster. Prices are similar to steel and may be cheaper in optimised designs.

The lightweight technology could lead to a resurgence in leaf spring suspension. Volkswagen used GRP leaf springs in the design of its 1 litre/100km experimental car project in 2002.