



# Hexcel Composite Materials Automotive Product Focus



HexPly® Prepregs



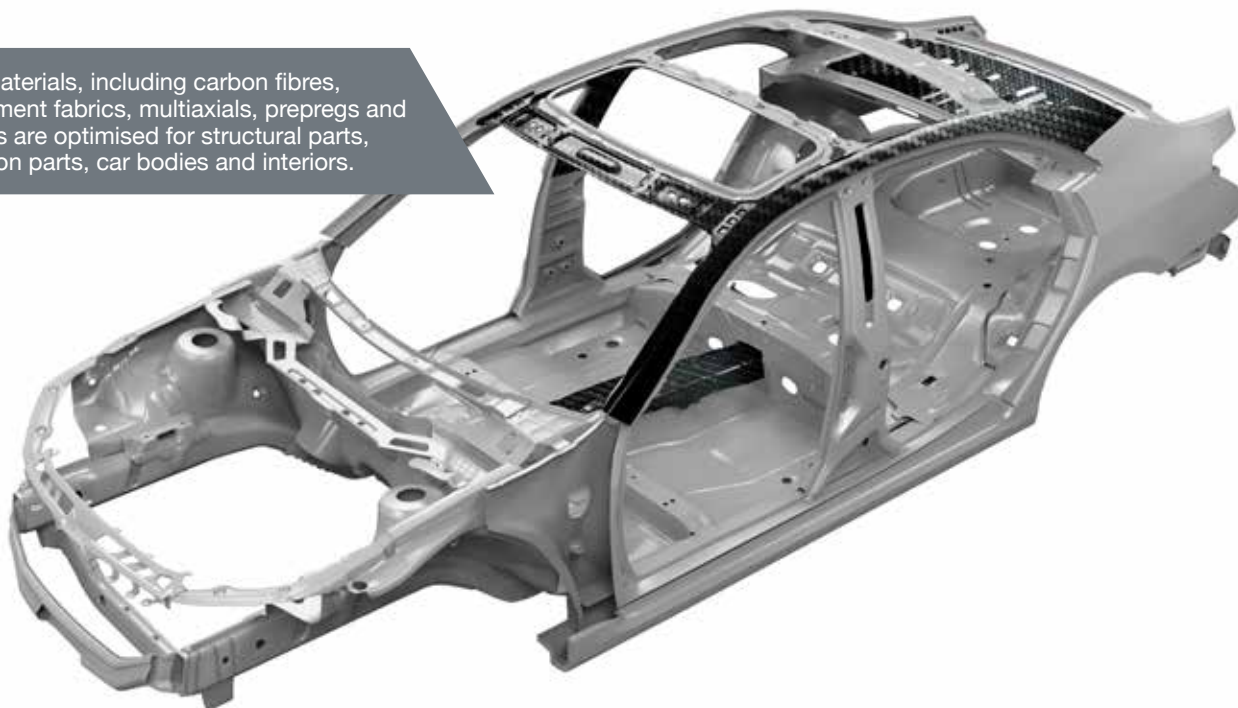
HiMax™ Multiaxial Reinforcements



Redux® Adhesives



Hexcel materials, including carbon fibres, reinforcement fabrics, multiaxials, prepregs and adhesives are optimised for structural parts, suspension parts, car bodies and interiors.



## HexPly® Prepregs

### HexPly® snap curing prepreg stacks for automated processing.

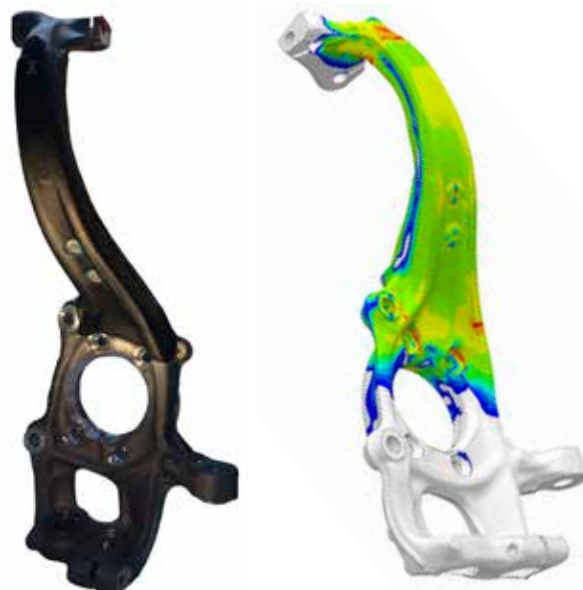
Developed to satisfy performance requirements for compression moulded components, HexPly® M77 is a robust snap curing prepreg matrix with very high toughness. This new formulation combines the benefits of rapid curing (2min cycle time at 150°C) with a long shelf life at room temperature and low surface tack. Low tack characteristics are particularly important for high volume production process requirements as they allow uncured materials to be handled and manipulated by machine without adhering to the equipment.

HexPly® M77 CFRP technology was introduced in the BMW 7 Series where a preform made of UD Carbon prepreg is used to reduce weight and reinforce the shell of a steel B-pillar. Hexcel's automated production line in Austria combines prepreg layers at various orientations with an adhesive film.

- High volume prepreg stack production, up to 500 car sets of B-pillar preforms per day.
- On line process inspection, integration of adhesive and automated packaging.
- Hexcel's robotic prepreg stacking line outputs 2D Netshape preform in < 1min.
- HexPly® M77 epoxy system cures in < 2mins.

Hexcel also worked with Saint Jean Industries to develop and supply materials for a novel new aluminium and CFRP hybrid suspension knuckle. The new

component, optimised via Hexcel's FEM analysis, is 26% stiffer yet maintains the same critical dimensions, providing significant cost reductions as one part can now be used throughout the vehicle range.



Aluminium/CFRP hybrid suspension knuckle by Saint Jean Industries



## Redux® Adhesives

For the hybrid suspension knuckle a new adhesive film was required. Hexcel's Redux® 677 was developed to work in conjunction with HexPly® M77 prepreg stacks by ensuring excellent load transfer, eliminating corrosion and providing compensation for CTE differences between metal and CFRP parts.





## HiMax™ Multiaxial Reinforcements

### HiMax™ multiaxials for complex 3D geometries.

Hexcel's HiMax™ range of high drape multiaxial reinforcements provide tailored solutions for RTM and infusion processing where prepregs may not be suitable. Available in a wide range of fabric styles, ply weights, fibre orientations and fibre types, these highly drapeable reinforcements are suitable for complex geometry structural parts like monocoques, as well as parts with a superior, high-quality surface finish.

- Biaxial, triaxial and quadaxial fabrics with ply angles from 22.5 - 90 degrees
- High performance fibres as well as heavy tow fibres
- Standard width of 1270mm, up to 1600mm on application

Reinforcement fabric characteristics such as drape, stability and permeability can be varied by Hexcel's textile engineering team to ensure the optimum process performance and quality in the finished part.

HiMax™ fabrics have been extensively used in series CFRP monocoque chassis components and are available with and without a powder binder making them ideal for high volume RTM manufacturing. Another recent application saw HiMax™ multiaxials, developed with a unique high drape stitch pattern, improve finished part quality and satisfy cost targets for a complex moulded floor panel component.

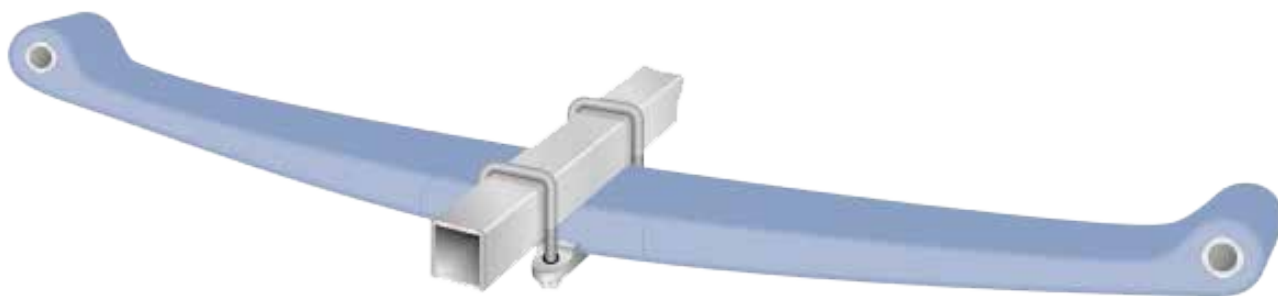
Hexcel announced in 2017 that it is expanding its multiaxials manufacturing capabilities as part of a



UK government-backed £7.4 million research and development project.

HiMax™ DPA (Dot Pattern Adhesive) fabrics are pre-tacked to assist the laying up of multiple fabric layers prior to resin infusion or RTM without the use of spray-on adhesives. The DPA process ensures that a controlled, consistent level of adhesive (typically just 3g/m<sup>2</sup>) is applied by machine, in dots across the whole fabric. The spacing and spread of the adhesive is optimised to reduce interference with the resin flow, allowing the manufacturer to simply unroll and apply the HiMax™ fabric to the mould, add a layer of core material or more fabric layers, and reposition as necessary before introducing resin. The health and safety benefits are clear as solvent-based adhesives are no longer required and the risk of applying too much adhesive or causing contamination is avoided.





## HexPly® Prepregs

### Suspension systems

Hexcel has launched a new prepreg system specifically designed for manufacture of composite leaf springs. In contrast to steel leaf springs currently used for suspension on vans, trucks and SUVs, newer glass or carbon fiber composite versions offer clear advantages. Weight savings of up to 70%, high corrosion resistance and improved riding comfort are all advantages of composite leaf spring solutions. Hexcel's new prepreg, HexPly® M901, offers

a 50% cure time reduction, 15% higher mechanical performance and exceptional high temperature performance compared to standard industrial prepregs. Combined with Hexcel's manufacturing capability for heavy weight glass UD prepregs, with fiber areal weights up to 1600 gsm, this material provides a highly cost competitive solution for these components.

### For more information

Hexcel is a leading worldwide supplier of composite materials to aerospace and industrial markets. Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax™ multiaxial reinforcements
- HexPly® prepregs
- HexMC® molding compounds
- HexFlow® RTM resins
- Redux® adhesives
- HexTool® tooling materials
- HexWeb® honeycombs
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products

For US quotes, orders and product information call toll-free 1-866-601-5430. For other worldwide sales office telephone numbers and a full address list, please go to:

<http://www.hexcel.com/contact/salesoffice>

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