

## INNOVATION IN COMPOSITE MATERIALS

**FINALIST: James Cropper / Hexcel**

UNIMAT™ represents a step change in scalable circular composites. Developed by James Cropper, it combines aligned, discontinuous fibre architecture with proprietary VECTIS™ alignment technology to create a production-ready reinforcement using recycled, post-industrial waste or virgin fibres.

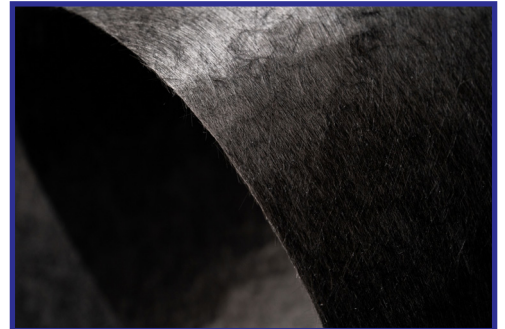
UNIMAT achieves fibre alignment approaching 95% in a nonwoven format and can be manufactured at up to 1200mm width, with current capacity approaching one million square metres annually. Unlike conventional recycled carbon fibre materials, it combines directional mechanical performance, formability and industrial scalability. Supplied as a dry reinforcement, UNIMAT integrates with established processes including prepreg lay-up, RTM and compression moulding. It addresses a major barrier to composite circularity: converting recycled carbon fibre into a consistent, high-value material suitable for repeatable manufacturing. Over 30% of carbon fibre production becomes waste, creating significant potential to reduce waste and reliance on virgin fibre.

The technology was developed in an AS9100-accredited manufacturing environment, combining advanced material engineering with scalable nonwoven production. James Cropper led development of VECTIS™ and UNIMAT, while collaboration with Hexcel through the European Composites Circular Alliance (ECCA) has supported application validation, processing development and alignment with aerospace performance requirements.

UNIMAT enables recycled carbon fibre to move beyond downcycling into higher-value, performance-driven applications, including aerospace. Its 20–200 g/m<sup>2</sup> areal weights allow straightforward integration into existing composite designs and manufacturing processes.

The long-term opportunity is to establish recycled carbon fibre as a scalable reinforcement for high-performance composites, supporting industry and OEM ambitions to increase recycled content, reduce waste and lower dependence on virgin materials. By keeping carbon fibre in use across multiple lifecycles, UNIMAT provides a practical pathway towards truly circular composites.

Learn more at: [www.advancedmaterials.jamescropper.com](http://www.advancedmaterials.jamescropper.com)  
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