

MAKO Advanced Materials Introduces Creel-Free Unidirectional Carbon Fiber Prepreg with HyperCure Technology

MAKO launches Creel-Free Unidirectional (UD) Carbon Fiber Prepregs with HyperCure technology, offering faster cure times, lower order minimums, & shorter leads.

HENDERSON, NV, UNITED STATES, September 14, 2026 / EINPresswire.com/ -- MAKO Advanced Materials, a U.S.-manufacturer of advanced composite materials, announced the availability of its new [Creel-Free UD Carbon Fiber Prepreg](#). The new material integrates custom carbon unidirectional reinforcement with the company's proprietary HyperCure epoxy resin system. This development provides composite manufacturers with shorter lead times, lower minimum order quantities, and substantially faster cure times than traditional unidirectional prepregs.

Designed to serve the [aerospace](#), defence, motorsports, medical, marine, and sporting goods sectors, the Creel-Free UD prepreg allows engineers to place carbon fibers exactly where they are needed for maximum structural efficiency. Furthermore, the material can cure in <10min, at the same rate as HyperCure woven prepregs within the same laminate stack, streamlining the manufacturing process.

The Role of Unidirectional Prepregs in Advanced Composites

Unidirectional prepregs differ from woven materials because all fibers are aligned in a single direction rather than interlaced. This linear alignment allows component designers to optimize



MAKO Advanced Materials Logo



Unidirectional (UD) Prepreg Applications

laminate construction by orienting individual plies to match the specific anticipated load paths of the final structure.

The advantages of unidirectional fiber alignment include higher stiffness and strength in the primary direction of the fibers, increased efficiency due to minimal fiber crimp, and improved tensile and compressive mechanical performance. These factors lead to a reduction in overall laminate weight while maintaining or improving structural capability. Engineers often build laminates by stacking unidirectional plies at specific angles to precisely match the structural requirements of the application. In many advanced composite structures, unidirectional prepregs are utilized for the primary structural reinforcement, while woven prepregs are applied to the exterior for impact resistance, cosmetic finishes, or protective surface plies.

Overcoming Traditional Manufacturing Limitations

While the structural benefits of unidirectional carbon fiber are well documented, conventional manufacturing methods present logistical challenges. Standard manufacturing requires a massive creel setup, which demands significant floor space and processing time. Because of this extensive setup requirement, legacy material providers require high minimum order quantities and extended lead times. They are also less likely to accommodate requests for custom weights, alternative fibers, or specialized resin formulations. High-volume consumers often consume standard production runs, limiting availability for smaller scale manufacturers.

MAKO developed the Creel-Free process to solve these supply chain bottlenecks. By starting with carbon fibers that are already aligned and stabilized for coating, the company bypasses the traditional creel setup. This allows MAKO to manufacture unidirectional prepregs in smaller batch sizes and with the same short lead times expected for standard woven carbon prepregs.

This agile production model also simplifies custom resin changes. Manufacturers can specify the HyperCure epoxy, flame-retardant epoxy, or custom resin formulas suited for specialized applications such as honeycomb core bonding or toughened sporting equipment.

Material Specifications and Customization

The Creel-Free UD product line offers extensive customization to meet diverse engineering requirements. Fiber options include Standard Modulus T700 and Intermediate Modulus T800 fibers, with custom widths and areal weights available upon request. High Modulus fiber options are also available in specific configurations.

The materials are offered in a broad selection of areal weights to accommodate applications ranging from lightweight drone components to heavy structural laminates. Configurations start as light as 55 grams per square meter. Stitched unidirectional options, featuring combined plies, are available at 250 grams per square meter or higher. Standard widths include 12 inches, 24 inches, 39 inches, and 50 inches, depending on the chosen fiber type.

Integration with HyperCure Epoxy Resin System

MakoBond Creel-Free UD prepregs can be manufactured with the proprietary HyperCure epoxy resin system. This combination allows manufacturers to add structural stiffness to composite parts that already utilize HyperCure resin on fiberglass or woven carbon and aramid fabrics.

The HyperCure system is engineered to reduce cure times while maintaining the mechanical performance required for advanced composite applications. The system achieves complete cure cycles in approximately nine to ten minutes, depending on thickness. This acceleration increases manufacturing throughput, reduces the energy consumed per part, and improves overall production efficiency without compromising laminate quality or fiber wet-out.

Unlike older fast-curing resin systems, HyperCure maintains a standard outlife of 30 days at room temperature. The resin is highly versatile, remaining compatible with both low-temperature cures required during the prototyping stage and the high-temperature rapid cures utilized in full-scale production.

Industry Applications and Operational Efficiency

The combination of optimized fiber alignment and rapid processing speeds directly benefits several key industries. In the aerospace & defense sector, the demand for lightweight materials is constant. The ability to source custom aerial weights in small batches allows aerospace engineers to build prototypes for [unmanned aerial vehicles](#), and to flight test and develop allowables, before committing to full-rate production purchase quantities.

In space & satellite manufacturing, demand can start very small...then progress quickly. 1-2 satellites are proven before building a full constellation. The structural stiffness provided by the unidirectional fibers is essential for producing long, thin structures and supports for delicate equipment onboard. Low outgassing resin is frequently paired with creel-free UD for this industry.

Furthermore, the operational efficiencies gained through the Creel-Free process and HyperCure technology support broader environmental sustainability goals. Shorter cure times directly translate to reduced energy consumption during the manufacturing process. By enabling the production of lighter and stronger end-products, the materials also contribute to fuel savings and reduced emissions in transportation applications.

About MAKO Advanced Materials

MAKO is a developer and manufacturer of advanced composite solutions, including specialized epoxy formulations, adhesive films, and carbon fiber prepregs. Headquartered in Southern California, the company provides materials engineered for the aerospace, automotive, medical, and sporting goods industries. MAKO focuses on delivering high-performance, lightweight, and

thermally stable products that enhance manufacturing efficiency through rapid cure technology and custom formulation capabilities.

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