
MCM Composites Reinforces Thermoset Expertise With Understanding Thermosetting Plastics Guide

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MCM Composites, a manufacturer specializing in custom thermoset composite fabrication, provides an in-depth reference guide covering the properties, processing considerations, and industrial applications of thermosetting plastics. This guide gives engineers and procurement professionals a practical tool for evaluating these materials within their product development programs.

Thermosetting plastics are a distinct class of polymer materials that form permanent, cross-linked molecular networks when cured, resulting in components that maintain their shape and structural properties under sustained mechanical loads and elevated temperatures. This irreversible hardening process distinguishes them from thermoplastics, which can be repeatedly melted and reformed. The chemical stability that thermosets achieve through curing makes them a reliable material choice in environments where performance consistency is essential.

The MCM Composites thermosetting plastics guide details the most widely used thermoset resin systems, including epoxy, phenolic, polyester, and vinyl ester formulations, and explains how each resin type responds to heat, chemical exposure, and moisture over time. Engineers can use this information to compare material

behavior across different end-use environments and determine which resin system aligns with the structural and regulatory demands of a given project.

One characteristic highlighted throughout the guide is dimensional stability, a property that allows thermoset components to maintain tight tolerances across varying load conditions and temperature ranges. This quality is particularly valued in electrical insulation assemblies, load-bearing structural panels, and precision enclosures where consistent geometry is critical to system performance.

The guide also draws attention to the weight-to-strength advantages that fiber-reinforced thermoset composites offer compared to traditional engineering metals. By combining a lightweight polymer matrix with high-strength fiber reinforcement, engineers can achieve structural performance targets with significantly reduced part weight, a consideration that carries direct implications for energy consumption and component handling in many industrial applications.

"Understanding thermosetting plastics at a foundational level helps engineers and designers have more productive conversations with fabricators from the beginning of a project," said Michael Fredrich, CEO of MCM Composites. "The guide walks through material science concepts in a way that connects directly to manufacturing decisions, so customers have a clearer picture of what to expect at each stage."

MCM Composites thermosetting plastics work encompasses a wide range of reinforcement configurations and fabrication techniques. The company produces composite parts using fiberglass, carbon fiber, and aramid reinforcements combined with selected resin systems, applying processes such as compression molding, resin transfer molding, and hand layup to meet the dimensional and mechanical requirements specified by each client.

The guide addresses reinforcement selection in detail, noting how the orientation, weave pattern, and fiber type all influence the stiffness, tensile strength, and impact resistance of the finished component. Designers working with high-load or fatigue-sensitive applications benefit from understanding these relationships before finalizing part geometry and wall thickness.

Processing variables are also covered, including cure temperatures, hold times, and post-cure protocols that determine the final mechanical and chemical performance of a thermoset part. The guide explains these parameters without assuming prior knowledge of polymer chemistry, making it useful for engineers who are exploring composite solutions for the first time as well as those with existing experience in thermoset fabrication.

Corrosion resistance is a frequently cited reason for selecting thermoset composites over metal alternatives in demanding service environments. Thermoset parts do not rust and typically resist degradation when

exposed to industrial chemicals, saltwater, and continuous UV exposure when the appropriate resin system is selected. These characteristics make thermoset composites common across marine, chemical processing, utility, and transportation sectors.

"Thermoset composites continue to earn their place in high-demand applications because of how well they hold up over time," Fredrich noted. "When customers come to us with a complex material challenge, the goal is always to match the right resin system and reinforcement structure to the specific stresses and environment the part will face."

MCM Composites supports clients from initial concept through production, with engineering involvement at design review, material selection, tooling development, and quality validation stages. The company works with manufacturers across multiple industries requiring custom composite components built to precise functional and dimensional specifications.

For more information about the thermosetting plastics guide or to discuss a custom composite fabrication project, visit the MCM Composites website.

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MCM Composites

MCM Composites is a trusted leader in custom molding, providing high-quality solutions to a diverse clientele across the globe

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