

New SMC offers toughness, strength, and class A surface

A resilient form of glass fiber-reinforced polyester sheet molding compound (SMC) that can be compression-molded into automobile body panels having a class A surface has been developed by GenCorp Polymer Products, Akron, Ohio. Designated Flexion, the SMC combines strength with flexibility to prevent dings and dents.

According to GenCorp, conventional SMC provides strength and dimensional stability, but it lacks impact toughness and a class A surface. Thermoplastic materials provide toughness, but not dimensional stability. Flexion developers reportedly eliminated this trade-off by blending a thermoplastic additive into the polyester. This improves flexibility, impact toughness, and dimensional integrity, while maintaining a class A finish.

GenCorp researchers developed three different tests to measure the flexibility of Flexion. One involves bending around a mandrel, another tests how far the panel can bend, and the third uses acoustic energy to detect incipient cracks. These tests demonstrated the material's superior dent resistance.

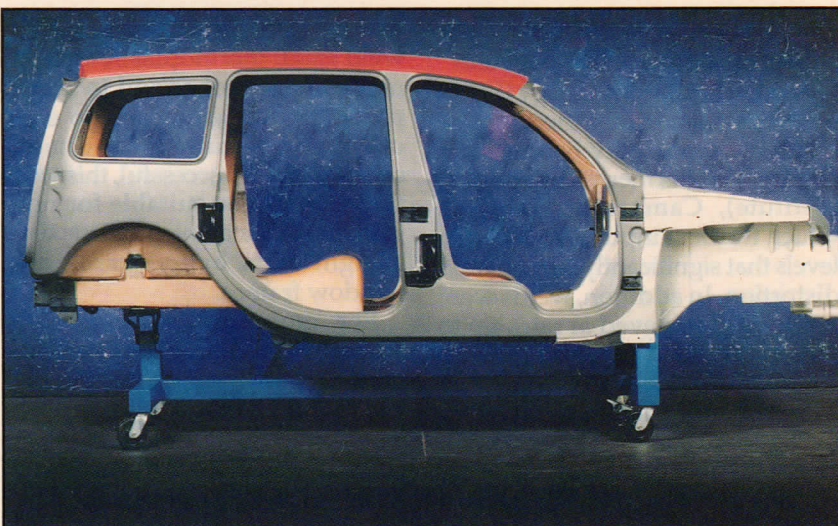
Flexion is to be applied in production door panels for the Chevrolet Corvette in 1995, and is being evaluated as a replacement for steel in the doors of other models.

For more information: GenCorp Polymer Products, 250 Springside Dr., Akron, OH 44333-2975; tel: 216/668-7000; fax: 216/668-7019.

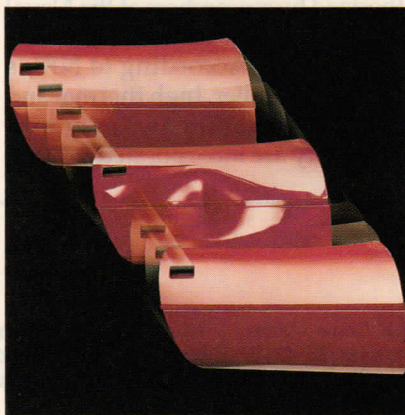
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New matrix resin increases operating temperature by 80°

A high-temperature composite-matrix resin designated AFR700B, developed at the Wright Laboratory Materials Directorate, Wright-Patterson Air Force Base, Ohio, has reportedly increased composite operating temperature capability by 80°C (150°F) compared with the previous material. The standard aerospace high-temperature resin is PMR-15, which has an upper operating temperature of 290°C (550°F). However, researchers at Wright



The body of this prototype minivan developed by Ford Motor Co. is made of vinylester resin reinforced by continuous-mat fiberglass. The composite is resin-transfer molded over a foam core, and parts are joined by adhesives.



The resilience of GenCorp's Flexion sheet molding compound allows it to spring back to shape after impact.

made some changes in the chemistry, and developed an improved PMR-15 having an operating temperature of 370°C (700°F). The AFR700B resin is reinforced with continuous fibers of graphite and glass.

The composite is being used to solve a recurring heat-damage problem on the F-117A Stealth fighter, whose fuselage trailing edges were being charred by exposure to hot exhaust gases from the engine. AFR700B solves the charring problem and will reportedly improve fighter performance while maintaining its required low-observable profile.

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Minivan spaceframe molded of fiberglass/vinylester composite

A prototype minivan spaceframe molded of 50% continuous-mat fiberglass in a vinylester resin matrix has been developed by Ford Motor Co., Dearborn, Mich. The only metal used in the new design is in the front-end engine support structure.

The spaceframe was resin-transfer molded by Excel Pattern Works, also of Dearborn, using preforms from Vetrotex CertainTeed Corp., Valley Forge, Pa., and resin from Ashland Chemical, Ashland, Ohio. The preforms and resin are molded around a low-density foam core supplied by BASF Corp. and American Sunroof.

The body consists of six components: the underbody, a cross-car beam, right and left body side panels, and inner/outer roof panels. The parts are joined through an adhesive bonding system that completely eliminates mechanical fasteners. The bonding system also contributes to the structural strength of the frame and speeds the production process.

For more information: Vetrotex CertainTeed Corp., Fiber Glass Reinforcements, P.O. Box 860, Valley Forge, PA 19482; tel: 215/341-7000; fax: 215/293-1765. Circle 134