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Glass microspheres lighten up the 2016 Corvette

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Chemically treated glass microspheres allow significant weight savings in body panels for the 2016 Chevrolet Corvette.

Continental Structural Plastics Inc. has developed a sheet molding compound in which glass microspheres replace calcium carbonate filler and shave 20 pounds off the sports car's Stingray Coupe model weight. Usage of TCA Ultra Lite is now in commercial production for the 2016 model.

CSP vice president of advanced research and development Probir Guha told Plastics News in a phone interview that the trick to the SMC formulation is getting the microspheres to stick better to the thermoset polyester matrix. CSP has developed a silane treatment for the beads so that one end of the silane molecule sticks to the glass microsphere and other to the resin.

"This allows lightweighting in mainstream manufacturing," Guha said. The new SMC is cost competitive with conventional SMC for this type of application "and at par with strength and finish properties."

CSP had been supplying more conventional TCA compound for the Corvette panels but the advantages mean the new SMC will replace it. Specific gravity of the previous SMC was 1.6 in the 2014 model year but will plunge to 1.2 in the 2016 model.

Guha said the typical SMC formula for this type of vehicle application comprises 20 percent by volume of glass fiber reinforcement, 35 percent resin and 45 percent filler, usually calcium carbonate. TCA Ultra Lite replaces some of the calcium carbonate to cut the SMC weight.

Guha said his firm treats glass microspheres from 3M Co. in a proprietary, patented process. Glass fibers are needed for strength in the compound so to reduce weight CSP focused on replacing calcium carbonate. Besides good dispersion and bonding with the resin, the microspheres need to flow well for processing.

"This new SMC is cost competitive with aluminum," noted Guha.



The 2016 Chevrolet Corvette uses a sheet molding compound developed by Continental Structural Plastics Inc. with glass microspheres to reduce weight.

Parts retain a Class A finish with the new compound.

A total of 21 body panels in the Corvette model are based on CSP's TCA Ultra Lite. The parts include doors, decklids, quarter panels and fenders. CSP's new compound survives the E-coat process and passes OEM paint tests. Also, tooling costs are low. For a production run of fewer than 150,000 vehicles, such composites can lower tooling costs by as much as 50 to 70 percent versus steel or aluminum.

CSP, based in Auburn Hills, Mich., first commercially used the new SMC in Corvettes but the company also makes it available to other companies trying to lose weight in vehicle components.

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