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Nano-enhanced SMCs improve performance, resolve paint issues

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News Item from: [Composites Technology](#)
 Article Date: 8/3/2009

Recent developments are paving the way to better sheet molding compounds (SMCs) for automotive applications.

Molded Fiber Glass Companies (MFG, Ashtabula, Ohio) has developed Nano-fill SMC, a proprietary formulation with a nano-scale additive that significantly lowers its density, compared to conventional microsphere-filled SMC. The trademarked Cloisite additive, supplied by Southern Clay Products (Gonzales, Texas), features magnesium aluminum silicate platelets that are 1 nm thick, 70 to 150 nm across, and surface-modified to enable complete dispersion into, and provide miscibility with, a thermoset resin. The Cloisite reportedly has been proven to enhance a resin's flexural and tensile modulus while lowering its coefficient of linear thermal expansion. The resulting SMC has a low specific gravity of 1.5.

Initially developed for General Motors' (GM, Detroit, Mich.) 2009 Pontiac Solstice Coupe, the technology also is in use on GM's 2009 Chevrolet Corvette Coupe and Corvette Z06. On the Solstice, the nano-SMC is used to mold a one-piece molded trunk compartment or "tub," which earned MFG the Process Innovation Award at the recent Composites+Polycon 2009 show. The 51-inch/130-cm wide tub weighs only 19.8 lb/9 kg, providing "essential mass reduction to assist in enhancing fuel efficiency," says GM material engineer Kestutis Sonta, who adds that the new material also saves money: "Since less material is used, there was less cost, because it's typically purchased by the pound."

Elsewhere, researchers at the University of Michigan (East Lansing) have combined the University's trademarked xGnP Graphene Nanoplatelets with SMC. According to UM's Dr. Lawrence Drzal, the SMC is stiffer so less is needed, saving weight and increasing fuel efficiency. Drzal, also chief scientist at startup XG Sciences Inc. (East Lansing, Mich.), points out that the conductive SMC can be electrostatically painted without the coatings currently required on most SMC car parts. The result is significant savings of time and cost.

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