Corvette car pictures © General Motors.

Space-age material for down-to-earth automotive solutions

OEMs have to meet even stricter industry regulations for fuel economy and the lowering of CO2 emissions which are pushing the design of sophisticated light-weighting metal-replacement alternatives, such as glass fiber reinforced polymers (GFRP), to new limits.

To further meet the light-weighting challenges facing automotive OEMs, Continental Structural Plastics (CSP), a world leader in diversified composite technologies and pioneer in reshaping the future of vehicle light-weighting, has introduced TCA® Ultra Lite™, a new generation of Tough Class-A (TCA) GFRP low density advanced composite material for exterior body panels and structural components. The first production use can be found on GM's 2016 Chevrolet Corvette Stingray Coupé model[1].

40 percent lighter

To help develop the new, innovative advanced composite material, CSP replaced calcium carbonate ($CaCO_3$) mineral filler with lower density glass microspheres together with Owens Corning's Advantex® ME1975, a new multi-end glass fiber roving specifically designed for use in SMC Class-A applications, particularly vertical walls.
Dr. Sanghamitra Sircar, Global Product Manager SMC at Owens Corning says,

"The unique formulation developed by CSP provides a 40 percent weight reduction when compared to standard SMC material, and depending on part design, can be as lightas aluminum yet more cost-effective."

Owens Corning also provided support on a range of technical engineering design, surface chemistry and processing optimization modifications, she added. The new material not only provides high mechanical properties, it is also e-coat oven-capable and provides a desirable superior Class-A surface finish that will not corrode, crack or scratch.

30 percent lower carbon footprint

With regard to sustainability, a Life Cycle Assessment (LCA) study[2] comparing a TCA Ultra Lite constructed deck lid versus an aluminum counterpart, designed to the same load and structural requirements, reveals a 30 percent lower carbon footprint to manufacture the TCA Ultra Lite product. Even when the complete lifecycle is considered, new state-of-the-art composites will become the light-weighting choice for OEMs over aluminum or other metals as more engineers understand its strength, design flexibility, unique moldability and exceptional surface aesthetics.

1 CSP press release July 21, 2015 (www.cspplastics.com/general-motors-lightens-the-corvette-with-continental-structural-plastics-tca-ultra-lite/)
2 Continental Structural Plastics, Auburn Hills, MI 2015. Life Cycle Assessment (LCA) studies comparing a composite deck lid vs. aluminum and steel.
TCA® Ultra Lite™ is a registered trademark and trademark of Continental Structural Plastics respectively.

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