Emissions requirements drive shift to thermoset truck parts

For components facing a long, hard existence in the engine compartments of heavy trucks, the material choice has often been some type of metal. But metal components can add a lot of weight to truck designs, which is a major concern at a time of rapidly rising fuel costs. What’s more, metal components have a greater impact now that the U.S. **EPA** has introduced new restrictions on diesel-engine emissions.

Many designers of under-the-hood truck components are switching from metals to thermoset composite materials. Thermosets meet all the requirements of under-the-hood applications but are much lighter than metal alternatives, making it easier for designers to comply with the new emissions standards without adding weight. Thermosets can also handle the higher engine-compartment temperatures that result from compliance with the standards. And, as an added bonus, the materials provide excellent corrosion-resistance properties and slash the time and costs involved in manufacturing under-the-hood components.

Composite materials consist of glass-fiber reinforcement in a polymer resin. Two common thermosets are bulk molding compound (BMC) and sheet molding compound (SMC) provides strength and durability for under-the-hood components such as oil drain pans, heat and noise shields, and valve and timing chain covers.

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SMC is also dimensionally stable, which minimizes warping and thereby helps parts maintain flat mounting surfaces. This allows SMC components to provide better oil sealing, which helps allay warranty-related concerns of truck manufacturers.

Another advantage of SMC is its ability to reduce engine noise. Tests show that the internal damping of the thermoset is 10 times that of steel and aluminum. Superior damping means that under-the-hood component designers who switch to SMC can expect 10-15% reductions in engine noise levels.

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Gary Littell, Applications Development Engineer at IDI Composites International, wrote this article for AEI.