

Responding to aluminum in auto body components

Accelerator pedals in motor vehicles are not typically made of laminated steel, but that material has been the accelerator for Material Sciences Corp. (MSC), winner of AMM's award for Best Innovation: Product.

Burr Ridge, Ill.-based New Star Metals Inc. acquired MSC this year, the latest boost for a company that formed a partnership a year and a half ago with Farmington Hills, Mich.-based Productive Research LLC, which had an idea for laminated steel but had made limited progress toward commercialization.

"They had shared the material with original equipment manufacturers (OEMs) but were not getting any traction," said Matt Murphy, MSC vice president of engineering solutions. "Over the past 18 months, we have taken the idea from a few handmade 12-inch by 12-inch samples to stamped and soon-to-be body-in-white vehicles."

The new material—called Smart Steel—is a lightweight steel laminate that the producer said is highly formable and weldable and can offer substantial mass savings vs. monolithic steel. The laminate addresses many concerns that arise when automakers and their suppliers consider sweeping changes to vehicle designs over a short period.

Specifically, MSC was responsible for optimizing the chemistry, construction and overall performance of the composite to meet automotive requirements. It also developed a cost-effective manufacturing process and invested in the resources necessary to produce, market and sell the product globally.

The composite is designed to replace nonstructural stamped panels for the body-in-white of vehicles without requiring substantial changes to the stamping, welding and assembly process. Smart Steel, which the company said provides more economical mass savings compared with aluminum, is engineered to be compatible with existing automotive manufacturing processes as well as for nonstructural galvanized and uncoated vehicle applications.

MSC is engaged with vehicle manufacturers on future programs involving mass savings of greater than 50 pounds per vehicle. "There has been a major push for weight reduction to meet rising fuel-economy stan-

dards," said Murphy, who has been with Elk Grove, Ill.-based MSC for 13 years. "MSC has a history of working with laminates. We engineered an acoustic laminate we call Quiet Steel for the Ford (Motor Co.) F-150 pickup truck and for Chrysler (Group) minivans. Typical steel needed an overlay for dampening, but we took that to the next level with a material that could be stamped and welded and offered the same performance."

Customers also were requesting weight reduction. "We have two development partners at the moment—I can't name them, but they are major North American automakers—and we are working with them

for the 2016-17 model year, Murphy said. "We are working to a timeline for full approval at the end of the year." The floor pan, for example, is typically 0.8-millimeter cold-rolled steel. Smart Steel meets the same thickness, stiffness, weldability and other criteria at just about three-quarters the weight.

Well aware of the push that aluminum is making into automotive manufacturing, Murphy said that OEMs and auto companies "have a desire to stay with steel. Aluminum is staring them in the face, so we are trying to provide a way for them to be able to stay with steel. Aluminum requires chang-



every week on weld, corrosion and fatigue testing," Murphy said. "From a coupon concept, we are now making this laminate in coil form. The weight reduction as compared to monolithic steel is 20 to 30 percent. The target market is body close-out parts,

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such as floor pans, dashboard, plenum, cowl and so forth. We are also discussing front and rear bumpers where Smart Steel could save 7 to 9 pounds per bumper. We have passed the chrome testing."

Smart Steel is part of the design of record

es in their infrastructure and manufacturing practices. There is also the issue of shelf life for coils of aluminum," he said.

Patrick J. Murley, chief executive officer of New Star Metals, said the company plans to make the Smart Steel itself. "We will produce it in our own equipment in Elk Grove Village. If we get three jobs, we are OK. If we get 10 jobs, we will have to add capacity," he said. "MSC was known for many years as an innovator, and all the employees are very proud of the AMM award. We placed it front-and-center at our technology center in Detroit. It is a true innovation—it is steel's response to the aluminum challenge."

"The core people are all very pleased. The award is a validation of all the work they have done over the past year and a half. That said, the true reward will be the acceptance of Smart Steel in the marketplace," Murphy said. **GREGORY DL MORRIS**