

THE FUTURE OF STEEL IN THE AUTO INDUSTRY

The auto industry's quest for improved fuel efficiency has focused considerable attention on "new" materials such as aluminum, plastic and magnesium. What does that mean for steel, the backbone of vehicle construction for a century? Steelmakers welcome the closer examination of options. They are very confident that their continuing flow of new and stronger steels will maintain the material's 60% share of materials used in cars for many years to come.



Larry Kavanagh

"We're working hard and fast," declares Lawrence W. Kavanagh, president of the Steel Market Development Institute in Washington, D.C. He predicts that steels

currently being designed into vehicles due in 2018-2020 will reassert the superiority of such materials in terms of value and performance.

What does the Steel Market Development Institute do?

We're a business unit of the American Iron and Steel Institute, which dates back to 1855. We develop and demonstrate new materials and applications that provide better value than competing materials in steel's major markets such as automotive, construction and packaging.

How is the steel industry responding to alternatives such as aluminum?

Fuel economy standards are forcing carmakers to evaluate all materials that can help them reduce vehicle weight, and that includes steel. Today's steels are three to five times stronger than aluminum and also stronger than steels available a decade ago. The "toolbox" of steels available today is bigger, and it is expanding at a faster rate than ever before. The auto industry's push for fuel efficiency demands lighter, stronger and more formable materials. The steel industry can deliver all three at higher value than alternatives. Yes, high-strength steels weld and form differently, so adjustments in the production process are necessary. But they don't require wholesale changes.

How much farther can steel go in helping carmakers lightweight their vehicles?

We can go much further. This process won't stop. It's a big commitment, but it's our business to innovate. When the White House finalized new fuel economy standards for 2025, we were already working on advanced high-strength steels for a decade. The new rules only accelerated our effort.

It's important to remember that cars don't get fundamentally redesigned every year. Big changes come only when there's a major platform redesign. That's when the big innovations in design, materials and powertrain occur. The auto industry's level of adoption of advanced high-strength steels is at only 40%-50% today, meaning that much of a vehicle's structure and body panels are still made with more conventional steels.

There's significantly more lightweighting to be gained simply by expanding the use of currently available steels. We're working with carmakers to show them the kinds of next-generation steels we're developing so they can plan for them now.

How can you be sure about continuous improvement in steel?

There are two ways to impact the properties of steel: processing and chemistry. You can look at the recipe of the material and how you mix, heat and cool it to produce steel. In the 1970s, you'd have to experiment in a bricks and mortar research facility and eventually on your production mill. As our industry rapidly adopted process automation, we were able to much more closely manage and control the entire production process.

Since then, computers have become vastly more powerful. Just as carmakers routinely use computer-based crash modeling to assess vehicle and material dynamics, we simulate the effects of changes in chemistry and processing through computational fluid dynamics and other modeling. We can evaluate many more options in significantly less time, and we can pick promising options much more accurately. In short, we can work on new materials with high confidence in the result. Steel plants apply the most sophisticated process controls in the manufacturing sector.

What are examples of steel-intensive vehicles that are especially fuel efficient?

Consider the new 2015 Chevrolet Colorado midsize pickup truck and its GMC Canyon sibling. They contain about 70% advanced high-strength steel, and they are the most fuel-efficient trucks in their segment with a combined city/highway fuel economy rating as high as 24 mpg. Similarly, Fiat Chrysler



Automobiles' fullsize RAM 1500 diesel is the most fuel-efficient truck on the market and was voted Green Truck of the Year by *Green Car Journal*. These vehicles show you can get tough, high-performing and fuel efficient vehicles using advanced high strength steels and without a switch to alternatives.

How do you see the auto industry's materials choices sorting out?

It's going to take time for the full power of our new steels to be deployed because of the nature of the auto industry's product development cycle. It's going to take another few years to play out, due to that timing. Our products get the job done at superior value—so we know we're going to win at the end of the day.

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