



PLASTICS MAKE IT POSSIBLE<sup>SM</sup> SHOWCASES EXCEPTIONAL INNOVATIONS IN PLASTICS. THIS MONTH WE LOOK AT HOW PLASTICS ARE USED IN TRANSPORTATION.

## SPOTLIGHT ON

### Plastic Composites Help Make the New 787 Boeing Dreamliner Possible

*Boeing is leading the way in utilizing plastic composite technology in commercial aircrafts*

The development and production of Boeing's 787 Dreamliner, a mid-sized wide body aircraft, has made headlines around the world.

Much of the attention has focused on the Dreamliner's extensive use of innovative plastic composites. Boeing has announced that as much as 50 percent of the primary structure of the 787 – including the fuselage and wings – will be made of composite materials, most of them plastic composites.

These materials help reduce the overall weight of the aircraft and contribute to a 20 percent reduction in fuel consumption, compared to a similar size aluminum-body airplane. Higher fuel efficiency also translates into lower carbon and other emissions during the lifetime of the aircraft.

*(See DREAMLINER, Page 2)*

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## Thinking about plastics and cars...

*Lauren Fix, The Car Coach®, gives us her thoughts on the increasing importance of plastics in the automotive industry*



*Lauren Fix with the new Mercury Mariner Hybrid. Many of the underbody systems in the Mercury Mariner Hybrid are made from post-consumer recycled plastics from detergent and water bottles. Ford estimates their use will divert between 25-30 million pounds of plastics from landfills.*

Every Auto Show season I see some remarkable innovations.

At the Los Angeles Auto Show the *Green Car Journal* partnered with "Plastics Make it Possible<sup>SM</sup>," an initiative of the plastics industries of the American Chemistry Council, to present the 2010 Green Car of the Year® at the *Journal's* Green Car Ride & Drive.

Plastics Make it Possible<sup>SM</sup> set up an intriguing booth at the entrance to the Ride & Drive. Auto and plastics experts had all kinds of innovative, lightweight car parts – door panels, engine components, bumpers, valves, running boards – that visitors could see, handle and compare. The display demonstrated just how prominent a role plastics play in today's cars and the weight and efficiency savings between older, metal parts and today's lighter plastic parts.

Plastics play a big part in vehicle light-weighting, a trend that we can expect to see more of with each new generation of green cars. In today's cars, plastics typically make up 50 percent of materials used by volume, but they are only 12 percent of the total weight.

Again at the Detroit Auto Show, the focus was on smart technologies that will make cars more fuel efficient. Plastic components, both interior and exterior, combine to help reduce overall vehicle weight. Lighter cars get more miles per gallon, which means spending less money at the gas pump and fewer emissions,

*(See LAUREN FIX, Page 2)*

## What's in your bumper?



*Plastics have enabled a revolution in the design of auto body parts, including bumpers. Nearly all of today's front and rear bumper fascias are made of lightweight plastic. And the energy management foam located between the fascia and the bumper beam provides a crush zone to cushion the effects of collisions.*

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In addition, the use of composite plastic materials reduces the scrap and waste produced from working with traditional materials. And plastic composite materials are also less susceptible to fatigue and corrosion, so Boeing expects the aircraft to last longer and require fewer repairs.

The use of composite materials might even make for more comfortable travel. The composite material can sustain lower cabin pressure at high altitudes and higher humidity levels than traditional aluminum-bodied planes, so it's expected that passengers will fly more comfortably and arrive at their destinations feeling more rested.

What is next for composite plastics in flight? The National Aeronautics and Space Administration (NASA) is researching the use of large composite structures for elements of its space flight programs. The high strength-to-weight ratio and overall lower mass of composite structures could make it easier for NASA to transport larger payloads to and from space.

For more information on the Boeing 787 Dreamliner, visit [www.boeing.com](http://www.boeing.com).

*The interior of the Dreamliner*



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which I definitely support. In fact, for every 10 percent reduction in vehicle weight, fuel economy improves by 5-7 percent.



*Lauren Fix*

Plastics also play a vital role in helping to make cars safer. From nylon seatbelts to airbags to plastic laminate in shatter-resistant glass, plastics help to reduce the risk of injuries to drivers and passengers in a crash. The use of plastic foam in key structures such as energy absorbing bumpers and framing also helps to cushion against a collision as well as reducing interior noise. Plastic composite materials can absorb 6 to 12 times more crash energy than steel. By filling key hollow steel components with plastic foam, a vehicle's structure can be made stronger, without adding weight. And by filling areas that support the roof structure, the chance of a roof collapse and passenger injury in a rollover can be reduced.

From a design standpoint, too, it's clear that plastics are driving creative innovations both inside and outside the vehicle. Many of the cool, sleek curves of today's cars wouldn't be possible without plastics. Newer aerodynamic designs are possible because plastics can be molded in ways that cannot be achieved with traditional materials, such as metal or glass.

Other design innovations include the use of scratch-resistant exterior panels with the pigment incorporated in the material, eliminating the need for costly new paint jobs. And just take a moment next time you're sitting in your car to count the plastic interior parts: seat belts, air bags, side air curtains, foam padding on the roof and pillars, door panels, trim, accessories, steering column and wheel, lighted displays, visor, glove compartment, electronics, even the door handle – it goes on and on. These are a huge part of your driving experience.

The growing use of bio- and recycled plastics is resulting in more innovations. For example, car seats may now contain foam cushioning and fabrics with bio-based ingredients. And carpet can be made of recycled plastic detergent and water bottles with padding from recycled plastic foams.

After my discussions with industry experts at the Plastics Make it Possible<sup>SM</sup> booth in LA and with automakers in Detroit, I walked away thinking that plastics have evolved into an impressive and essential part of helping the auto industry lose weight, improve fuel efficiency and keep drivers and car passengers safer.

## WE NEED YOUR INNOVATIONS!

The *Plastics Make it Possible*<sup>SM</sup> Newsletter is published by the American Chemistry Council to promote innovations in the use of plastics. Please tell us about your innovations at:  
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