Materials in Automobiles and Trucks Encyclopedia Article

Materials in Automobiles and Trucks

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Materials in Automobiles and Trucks

Advances in materials science have been a leading factor contributing to improvements in vehicle fuel economy and performance since the 1973 oil embargo. Better tire materials have reduced rolling resistance, better materials for moving parts have reduced friction, and most importantly lighter body parts have reduced the overall weight of vehicles.

The average 1993 model American car weighed about 3,200 pounds (1,450 kg) and delivered 28 miles per gallon of fuel (171 km/liter), representing a 19 percent reduction in weight and a 44 percent reduction in fuel consumption as compared to the average 1975 model. This reduction was achieved by substituting polymers for interior metallic trim, aluminum engines for cast iron, and careful design attention to weight factors. Weight reduction and improved engine design contributed greatly to better fuel economy. There is further potential for weight reduction through increased substitution of polymer matrix composites, aluminum, and ceramics for metals in vehicles.