

Stainless steel to drive the auto industry in future

The automobile industry underwent a major transformation of late. The demand for safety along with faster, lighter and fuel-efficient vehicles has altered the landscape of the auto world. Amid this transition, safety aspect in the automobile industry is a top priority for all automakers, as high-speed engines and lightweight vehicles have increased the risk factor for passengers.

Vehicle manufacturers perspective has changed to incorporate all safety aspects, be it passenger cars/buses or commercial vehicles. Safety features like seat belt, airbags and antilock brake system (ABS) do provide safety measures up to an extent, but more important is an efficient structural vehicle design that should be the focus of manufacturers as this becomes critical to the safety aspect in contemporary scenario of faster-moving and light weight vehicles. With respect to the evolving Indian scenario, the need for efficient structural design is high, as risk of loss of life has only risen going by the statistics indicating high road traffic accidents. Indian standards should relook at usage of crash-resistant material in structural design of vehicles and must



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be adhered to by formulating standardized guidelines. Loss of life and its societal impact apart from economic loss must bring

focus on improving vehicle design in India.

Why does design and safety element matter most? The increasing frequency and severity of recent Road Traffic Accidents (RTAs) in India involving modern vehicles have caused grave concern for road safety, posing serious challenge to policymakers, planners, regulators, police, engineers and civil society alike. With just 1 percent of the world's vehicles, India leads with 10 percent of the world's total Road Traffic Fatalities (RTFs) of 1.3 million, resulting in misery to lakhs of people, and leading the nation to lose about 3 percent of its GDP. Records from last decade from transport research wing of the ministry of road



transport and highways indicate that road traffic accident is the leading cause of unnatural deaths in India today.

Analysis has shown that major causes of RTAs are unsafe vehicle design and poor operating and maintenance condition. The vehicle's body should be made of a high-strength material which offers excellent energy absorption in relation to strain rate under impact. Technically, in case of accidents, impact resistance and crash worthiness of material determines the safety of passengers in a vehicle.

My point here is to establish the need for a high-tech material for safer vehicles. As statistics of casualties over a decade have proved that other than the use of safety features and new design, intelligent choice of material could dramatically reduce casualties of Road Transport Accidents. The contemporary technology in automobiles should be compatible and supplemented with a superior metal. Stainless steel so far has passed the litmus test and has emerged as an ecologically superior metal having high crashworthiness factor. As per study and tests done by the European Stainless Steel Development Association, stainless steel has the ability to absorb energy and harden during deformation or crash situations than carbon steel or aluminium alloy on roads. Thus, stainless steel emerges as the best material when it comes to improving vehicle's safety. The ease of formability and weldability can mould stainless steel into desired shapes and sizes required in passenger cars or commercial passenger vehicles.

The beauty of stainless steel lies in energy absorption capacity during road crashes, the quicker the deformation, more the material strengthens thereby reducing impact and thus

enhancing safety of passengers inside the vehicle. This quality of stainless steel is unmatched in contrast to any other metal or material used in making a vehicle body. Apart from this, integral qualities of stainless steel like corrosion resistance, 100 percent recyclability, fire resistance and tough mechanical properties add to the advantages of this metal. The usage of stainless steel reduces the vehicle's weight drastically making it fuel-efficient, thus making stainless steel a highly apt material for the vehicle's body fabrication. Stainless steel has particularly remarkable work-hardening properties, and high tensile strength, which make it an outstanding "crashworthiness" (resistant behaviour of the material in an accident) metal. The impact resistance of stainless steel is four times higher than mild steel. Therefore, stainless steel made vehicles would help in developing a safer mode of transit for people and contribute in saving lives. With comparatively low safety standards in India, the government must introduce mandatory standards for stainless steel usage in body



making for commercial and big passenger vehicles.

Worldwide stainless steel has proved its might in automobile world. Some of the Original Equipment Manufacturers in Finland and Australia have been using stainless steel for fabricating under frame and body of vehicles for the last 20-25 years. Many fabricators in USA also offer buses with stainless steel chassis & siding. In Europe 80 percent buses have stainless steel in different parts. The buses are lighter, with improved crashworthiness of the passenger compartment that requires less maintenance, and are more fuel-efficient. Amongst other transport application includes Sweden's X2000 high-speed train which is clad in austenitic stainless steel. Recently, France chose austenitic stainless steel for its new-generation trains.

Other parts of the world have acknowledged the mettle of stainless steel in transportation sector. Time is now ripe for the Indian fabrication industry to come up with advanced and modern technologies and align itself to global benchmarks.

Stainless steel is being used by body fabricators across the globe to provide better values to customers in terms of corrosion-resistant framework as it retains an attractive appearance for whole life, reduces maintenance and service costs, and most importantly ensures much safer travel for passengers. The application of right metal should be prime motive in deciding structural designs of vehicles. We should prepare and prevent loss of lives by not taking a less safer path, as safety should be more important than convenience.

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