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LIGHTWEIGHT STRUCTURES FOR THE 2012 CO2 CHALLENGE

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ABSTRACT

Innovative, lightweight design is an essential part of passenger car CO2 reduction and the design of hybrids and EVs. However, in order to be commercially successful, it must be achieved without compromise to performance (safety, durability, NVH), and within realistic time and cost constraints. Measures are required to considerably reduce current levels to meet legislation which comes into effect in the next 2 years.

Ricardo have developed a technical approach which has been applied to a number of lightweight body and chassis structure design studies. It is focussed on the extensive use of CAE tools for thorough target setting and concept development. Ricardo have benchmarked parts from popular, high volume production vehicles and applied the process to develop innovative design solutions to meet the cost, weight and performance aspirations of OEMs within typical vehicle constraints.

The design studies mainly make use of advanced and high strength steels. These materials are most compatible with current manufacturing and joining processes so are present a manageable step for OEMs with minimal cost implication. While advanced steels are more expensive, if less material is used for a part, then the cost impact can be minimised. If the light-weighting is combined with a cost-down study, increased cost through the use of exotic materials can be offset.

The results are used to generate a predicted vehicle level mass saving which may be achieved by 2012 and the subsequent CO2 benefit.