



Plastics Division

Implementing Plastic and Polymer Composite Lightweighting Solutions to Meet 2025 Corporate Average Fuel Economy Standards

An analysis of mass reduction opportunity studies demonstrates 2025 Corporate Average Fuel Economy (CAFE) Standards are achievable; plastics and polymer composites can yield further lightweighting benefits.

EXECUTIVE SUMMARY

Arguably the most influential force in the North American automotive market is the joint Corporate Average Fuel Economy (CAFE) standards set by the National Highway Traffic Safety Administration (NHTSA) and the U.S. Environmental Protection Agency (EPA), which set emissions and miles per gallon (mpg) requirements for model year 2025 vehicles to more than 50 mpg. This rapid mpg increase has the automotive industry searching for ways they can cost-effectively drop more and more weight from vehicles while maintaining quality and safety.

Several government agency-sponsored mass reduction studies indicate that polymer composites will play an important role in vehicle lightweighting, particularly over the longer-term.

Enabling Vehicle Mass Reduction with Plastics and Polymer Composites

The plastics and polymer composites industry has a long track record of delivering transformative innovations. Today, plastics and polymer composites deliver many performance and cost benefits due to their high energy absorption, resistance to harsh environments, and ability to enable substantial part consolidation in vehicle design. These benefits help automakers reduce

vehicle mass without compromising performance or safety, allowing them to comply with future CAFE standards. At a weight 50% lighter than conventional steel and 30% lighter than aluminum,ⁱ carbon fiber reinforced polymers (CFRP) are already experiencing aggressive implementation in certain niches of the automotive industry.

Call to Action

Regulatory impact analyses from NHTSA, EPA, and the California Air Resources Board (CARB) suggest that NHTSA's rulemaking process will not impose excessive economic and technological challenges upon automakers as they pursue mass reduction. These studies not only provide greater confidence that 2025 CAFE targets are feasible, but also highlight that plastics and polymer composites are an important part of the solution.

ACC's technology roadmap: Plastics and Polymer Composites Technology Roadmap for Automotive Markets, highlights technology advances needed to allow plastics and polymer composites to achieve their full potential. Much important work is already underway. Yet, far greater R&D investment is needed to ensure plastic and polymer composite technologies can sustain the pace of innovation required by automakers to meet proposed 2025 CAFE regulations.

ⁱPiers Scott and Mark Burton, "The New BMW i3," BMW Group, November 2013, <http://www.asymcar.com/graphics/14/i3/bmwi3b.pdf>.