

World's first rear axle transmission crossbeam made of plastic in the S-Class from Mercedes-Benz

Case Study

The world's first plastic transmission crossbeam in the rear axle subframe has been developed by ContiTech Vibration Control and BASF for the S-Class from Mercedes-Benz. It is made from the engineering plastic Ultramid® A3WG10 CR, a specialty polyamide from BASF which is particularly reinforced and optimized to withstand high mechanical loads. Compared to the previous beam made from die-cast aluminum, this highly durable component offers a weight saving of 25%, better acoustics as well as excellent mechanical properties even at high temperatures and conforms to the latest crash requirements. The design expertise of BASF's simulation tool Ultrasim® also made a major contribution to these properties.

The plastic load-bearing structural component meets all the requirements for the static and dynamic loads which act on a transmission beam: As a central component of the rear axle it supports part of the torque which is transferred from the engine to the transmission, and bears a constant share of the load of the differential. This is why the Ultramid® crossbeam is used in all the vehicle designs from Mercedes-Benz with all-wheel drive, with the exception of the AMG cars.

In order to replace the aluminum in this demanding, crash-relevant application, the plastic has to meet high mechanical requirements: The plastic Ultramid® A3WG10 CR (CR = crash-resistant), which is 50% glass fiber reinforced, shows optimum strength and rigidity and displays a low tendency to creep under constant loading. In addition, the material has to withstand high bending torques. The component shows good NVH performance (NVH= noise, vibration, harshness).

