CASE STUDY

Green tyres

Silicones improve ‘green tyre’ technology and performance

Tyres are just one way silicones are helping build a more sustainable future and increasing safety for everyone in daily life.

With more and more cars and trucks on the roads, people everywhere are concerned about the impact of traffic on the environment. Car manufacturers are continually working on improving cars’ environmental performance. One major step forward is the widespread use of lighter materials, such as plastics, to help reduce the weight so that vehicles burn less fuel.

Fuel efficiency is key and tyre technology can make a major difference to fuel consumption, which protects the environment and also benefits consumers as oil prices continue to rise to new highs.

Advanced silicone technology now plays a major role in developing more fuel efficient tyres, known as ‘green tyres’. This is possible via silanes – members of the silicone family – which are used in the manufacturing process, producing a tyre which saves fuel through reduced rolling resistance on the road. These tyres improve safety as well, improving grip in wet conditions.

The carbon black in the tyre tread compounds is partly or entirely replaced with precipitated silica treated in situ with special sulphur-containing silanes, resulting in better end performance. The silanes improve the chemical bond between the tyre fillers and the rubber.

The low resistance of these silane treated silica rubber tyres and the excellent rolling capacity results in reduced fuel consumption as the vehicle’s engine does not have to work as hard to achieve forward movement. Reduced fuel consumption obviously means lower CO2 emissions.

These tyres have an equal resistance in terms of wear compared to conventional, carbon black rubber tyres.

Silicones are also used in other areas of tyre production as well. During the manufacturing process, the silicone release agents prevent the adhesion of the base product to moulds and curing bladders, which as an additional benefit increases productivity.

Read more:
De Poortere, Michel (2007) Silicone Chemistry: Driving Innovation in the Tire Industry, Tire Technology Expo, 15-17 March 2007