Tire developments

In today’s legislative and economic climate, in which environmental aspects are becoming more and more important, car manufacturers require three main qualities in tires: low rolling resistance (improving fuel efficiency), excellent grip (increasing safety) and low wear (extending lifetimes).

In addition to these requirements, the European Union has defined mandatory standards for rolling resistance, wet grip and noise, and emission-based tolls are expected to be introduced within the next few years. At Teijin Aramid we are continually improving our aramid solution Twaron to meet both these future requirements and the needs of tire manufacturers today.

Key benefits when using our aramid

- Low weight
- Low rolling resistance
- High thermal stability
- High uniformity
- Reduced fuel consumption
- Improved comfort, safety and longevity

Creating durable tires that improve fuel efficiency
Broad benefits with advanced ingredients
Aramid’s superior performance-to-weight ratio makes it the material of choice for reinforcing high-performance tires. As a result, major tire producers are increasingly using Twaron in customized applications to meet speed, handling and comfort requirements.

Twaron: reinforcing tire structures
Twaron is the tool par excellence if you want to reduce tire weight while maximizing tire safety and longevity. What started out as a niche technology for racing tires – thanks to its high performance and ultra-low weight – is now an essential component in most tires, including mainstream passenger car tires.

It’s used in the cap ply, where it’s clearly superior to polyamide, in the belt and carcass, and to stiffen the side walls. The steel cord in tires is also protected by Twaron and a high-modulus variant is used in bead wire and other applications. Twaron can be used to replace steel cord in the carcass of a truck tire. In a common truck tire, with a load index of 140-146, this will reduce the weight of a tire by 3 kg. Reducing the weight of tires will make an important contribution to reducing fuel consumption.

Physical benefits
In motorsports, aramid is more durable and has excellent ‘cut belt’ properties. In trucks, tires are lighter and last longer. This benefit also applies to aircraft tires and there’s less chance of damage and greater resistance to compressive loads. In diggers and agricultural tractors there is better punch resistance. In bicycle tires a foldable bead becomes possible, there’s enhanced protection against punctures and better cut, chip and chunk resistance.

Hybrid technology: best of both worlds
Where full aramid cords can be rather stiff for the dynamic conditions in a tire, solutions are often found in the use of hybrid cord technology that combines aramid with another textile yarn. Variations in cord construction or process parameters allows to design a cord with the desired behavior. The possibilities are almost endless. Selecting the right combination gives the cord the properties that it needs at every stage of the tire life cycle and takes full utilization of the high performance that the aramid yarn provides.

The benefits of hybrids are:
• low modulus behavior during vulcanization;
• high modulus behavior in the vulcanized tire;
• improved fatigue;
• large freedom of design;
• nearly unlimited number of stress-strain curves possible.

With Teijin Aramid’s materials, tire manufacturers can meet the growing performance demands from markets, consumers and regulatory authorities.

For more information, please e-mail us at tires@teijinaramid.com or visit www.teijinaramid.com.

We do not accept any liability for the results of the use of these products. The technical data in this leaflet reflects our best knowledge at the time of publication. The content of this leaflet is subject to change, depending on new developments and findings, and a similar reservation applies to the properties described in it.