



WHITE PAPER

Tire management: how a 4R vision helps preserve our tomorrow

How many of us have used a vehicle rolling on tires today to go to work, drive the children to school or go shopping? Our entire transportation system relies on tires. And not only are we using tire-based vehicles to move as passengers, but we make an extensive use of them to move around tons and tons of goods¹ every year. In the European Union (EU28) in 2017, 50% of all goods relied on road transport and this number goes up to almost 61% in the USA².

This constant movement of people and goods generates 1.5 billion of waste tires every year. Because of their central role in freight and passenger mobility, tires can and must play their part in contributing to a greener world. If correctly managed, they can help reduce CO2 emissions and waste stockpile, setting the path forward for a circular economy-based system.



In road transport, tires are the only element of a vehicle touching the ground. They are essential to hold the vehicle safely on the road, supporting its weight while absorbing the shocks coming from vibrations, providing grip and maintaining steering and directional control.

Because of their central role in keeping the world running, tire manufacturers are constantly researching and innovating features that can ensure safe mobility and superior performance. Over the last few years, these innovation efforts focused on improving tires' sustainability, trying to lower as much as possible the

impact they have on the environment. Here is where the concept of rolling resistance comes into play. Rolling resistance is defined as the force resisting the motion when a body rolls on a surface: being tires the only link between the vehicle and the ground, they can be responsible of up to 30% (when properly inflated and maintained) of the vehicle's fuel consumption³. Innovation is helping in this sense: since the 1990s, Low Rolling Resistance Tires have entered the market, allowing for improved fuel savings. Other technological innovations, such as Tire Pressure Monitoring System (TPMS), help us keep track of the inflation and act as soon as something is wrong in order to restore the ideal situation.



Technology and constant innovation are key in making tires more sustainable but they would be completely useless without us, the users, making the right decisions. Indeed, there is a lot each one of us can do to preserve our environment: tires are not only a mean to move freely but can become part of a true circular economy, based on Repair, Reuse Recycle and Repurpose: a 4R vision. We believe in a greener future and through a 4R vision it can become a shared responsibility.

Repair is tightly linked to resource conservation: why changing an entire tire if it can instead be repaired and roll for many more miles? The number of damages that current state of the art technology cannot repair is very

¹ ANFIA, *Dossier trasporto merci su strada* Aprile 2020
² Transportation Statistics Annual Report 2020

³ ETRMA position towards sustainable mobility for cars and light duty vehicles

small, avoiding an unnecessary waste. Repairing a tire is cheap, accessible to all and ensures maximal driver safety.

If a tire does not have any puncture or damage but is simply worn out, it can be easily retreaded. Although not very well-known to the wide public, this process allows to Reuse the casing of the tire, and just replace the tread. This can be done several times and ensures the highest safety standards: few know that most aircraft tires, which because of their function need to comply with particularly strict safety rules, are almost all retreaded and can undergo this process up to 12 times. According to the European Tire and Rubber Manufacturing Association (ETRMA), one retreaded tire can reduce waste of approximately 160kg and save 104 kg of raw material⁴.

Sooner or later, however, all tires reach the end of their journey and need to be treated in some way. Up until not so many years ago, tires were just dumped in landfills or thrown on the ocean floor. Whilst unfortunately this is still the case in many parts of the world, there is a growing awareness towards the possibility to Recycle them. Through recycling, a tire can be born again and truly enter into a circular economy model. The recycling process may start with a downsizing phase, if the tires are too big to be processed as they are. If this is not the case, it usually starts directly with the shredding phase, during which tires' individual components (rubber, steel and textile) are separated and reduced into smaller pieces. Tires treated this way can have a lot of possible applications: they can be used in energy recovery as Tire-Derived-Fuel (TDF), in civil construction projects as Tire-Derived-Aggregate (TDA), in rubberized asphalt, infill for artificial turf or they can be further processed thanks to a pyrolysis or devulcanization plant.

Repurpose brings recycling a step forward. By taking the rubber crumb coming out from the recycling process, new products are created that have nothing to do with what a tire was created for. This usually happens through a moulding process, in which the rubber is mixed with a binding agent and then pressed in a mould to give it a completely new shape. The most well-known examples are rubber mats used in children's playgrounds but the number of applications is enormous and many still need

to be discovered. Rubber, thanks to its excellent noise and vibration damping characteristics, can be used in a wide variety of applications. How often have we wished our neighbor to turn down the volume of his music or our colleague not to be so loud when walking on her high heels? Using recycled rubber sheath to this aim can considerably reduce those annoying effects and increase our life quality while at the same time boosting circular economy.

Tires are necessary to keep our economic system move. The growing attention to the environment has driven forward research in new technologies that help save raw materials in the production process while ensuring the highest safety, quality and performance standards. One recent innovation that is being developed based on this philosophy is the airless tire: made of 100% recyclable materials, it promises to be more robust, avoid tires thrown away because of non-reparable damages and allows for an increased number of miles driven.

Making conscious decisions starts when we enter a tire shop to buy new tires and continues when we decide to use recycled tires-derived products in our new house. We often perceive the rhetoric around circular economy, sustainability and climate change to be part a top-down process, where "countries" need to put in place a bunch of actions to reach specific targets: it is a "they" vs "I". In reality, no such contrast exists because countries are made of citizens, that by starting with small and apparently meaningless actions, can make the difference, nurturing a collaborative culture based on the "us".

This new perception unveils a stunning yet simple truth: acting at governmental level only is not enough to change the current paradigm of human kind living and exploiting the nature. The real game changer is restarting from that "human", giving value to individuals deciding today to preserve our tomorrow. In tire management, a 4r vision is the conceptual framework to grow people awareness, empowering them to have a visible impact on the world. The change start with ourselves: let us not forget this to build the world we want to live in.

⁴ <https://www.etrma.org/key-topics/circular-economy/>

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