

## Recycled Rubber, Rice Husks and Plastic Bottles: Sustainable Materials in Tire Production

- **Continental consistently optimizes its tires in the direction of increasing sustainability**
- **Target by 2050 at the latest: tires made entirely from sustainable materials**
- **Maximum safety on the road thanks to the ideal blend of raw materials**

Mississauga, ON., February 15, 2023. Car tires are round, black and made of rubber. Look closer, however, and you'll see that the design of tires and the interaction of the various materials that go into making them are highly complex. But for some time now, Continental's material experts and tire engineers have been bringing about a silent revolution. By 2050 at the latest, all tires will be made of sustainable materials. There is still a long way to go until then. But step by step, it is already becoming apparent which raw materials will find their way into tire construction in the future. These include waste products from agriculture – such as the ash from rice husks – rubber from dandelions, recycled rubber or PET bottles.

Claus Petschick, Head of Sustainability at Continental Tires, is clear about Continental's mission, saying, "Continental is on the road toward becoming the most progressive manufacturer in the tire industry in terms of sustainability. At the latest, we aim to use 100 percent sustainable materials in our tire products by 2050." He adds, "Our innovative power enables us to break new and even more sustainable ground. This innovative power encompasses everything from the origin and sourcing of our materials to the reuse and recycling of our tires."

Already today, around 15 to 20 percent renewable or recycled materials are used in a standard passenger car tire from Continental. Continental continuously analyzes and reviews all raw materials used in tire production to increase the proportion of sustainable materials and conserve valuable resources.

### **Perfect material matching for maximum safety**

Depending on the application, season, and environment, tires must fulfill specific requirements. These elements can be seen in, for example, the tread design. But in other areas – the composition of the rubber compound, for example – these changes are not so readily

visible. Passenger car tires from Continental consist of as many as a hundred different raw materials.

The ability to deploy the various materials with their unique properties and interdependencies in specific ways is a complex balancing act for Continental's engineers and material experts. Their precise composition significantly impacts the tires and their handling characteristics. Only when all the materials are ideally matched to each other can safe, energy-efficient, durable, high-performance tires be created.

### **Natural rubber is still essential thanks to its exceptional properties**

Natural rubber is essential for ensuring outstanding tire performance. This natural product accounts for between 10 and 40 percent of the entire weight of modern high-performance tires. Its unique properties include a high level of strength and durability, which are caused by the strain-induced crystallization of the rubber. The tire industry is the biggest consumer of global rubber production, accounting for more than 70 percent. However, Continental considers natural rubber a sustainable material only if it is sourced responsibly. Therefore, the company employs an integrated approach to make natural rubber's complex and fragmented supply chains more sustainable, including using cutting-edge digital technology, local involvement and close collaboration with capable partners with the goal of improving transparency and traceability along the entire value chain. Meanwhile, with its Taraxagum project, Continental is pursuing an innovative approach to ensure that it can become less dependent on natural rubber grown primarily in Southeast Asia. The tire manufacturer is working alongside partners on industrializing the extraction of natural rubber from specially cultivated dandelion plants.

### **Sustainable plant-based fillers**

In addition to rubber, fillers such as silica are essential to tire assembly. For example, silica helps optimize characteristics such as grip, rolling resistance and tire life. In the future, rice husks will be used as the source material for sustainably produced silica. Rice husks are a waste product of rice production and cannot be used as food or animal feed. Silica derived from rice husks ash is more energy-efficient when used in manufacturing than that obtained from conventional materials such as quartz sand.

Plant-based oils – rapeseed oil and resins based on residual materials from the paper and wood industries – offer an alternative to crude-oil-based fillers in Continental's tires. Oils and resins allow

for flexibility in tire compounds, improving the material's grip. Only oils that meet technical quality standards and are unsuitable for consumption are used.

### **Expanding the circular economy**

At the latest, Continental is aiming for fully circular operations in its tire production by 2050. In addition to using renewable materials, the company is working systematically on using recycled raw materials in tire production. This process is intended to ensure that carbon black – another crucial filler in rubber compounds – can be obtained on a large scale. Continental recently signed a development agreement with Pyrum Innovations, intending further to optimize the recycling of materials from old tires. To do this, Pyrum breaks the old tires down into their constituent parts in an industrial furnace using a special pyrolysis process. In this way, valuable raw materials contained in end-of-life tires can be extracted and recycled. Both companies are working towards obtaining high-quality raw materials from the pyrolysis oil obtained for Continental's tire production in the medium term, in addition to the direct use of high-quality carbon black. In the long term, the premium tire manufacturer and Pyrum are aiming to establish a closed-loop circular economy concept for recycling old tires.

### **Recycled rubber from end-of-life tires**

In addition to pyrolysis, Continental uses mechanical processing of end-of-life tires. Rubber, steel and textile cord, in particular, are separated, in a highly sophisticated process, from one another. The rubber is then prepared for reuse as part of new rubber compounds.

Continental has a long history of consistently introducing end-of-life tires into the circular economy to conserve resources and the environment. A material known as "Conti-Reclaim" has been obtained as part of the truck tire retreading process at the company's plant in Stöcken in Hanover since 2013. It has been used in tire production at Continental for years. To expand the range of applications for recycled rubber and optimize the properties for the various application fields, Continental uses "Conti-Reclaim" and recycled rubber from other suppliers.

### **Recycled plastic bottles in the tire casing**

"Recycled raw materials will play a big role in making tires more sustainable. We use recycled materials whenever possible. Comparable quality and material properties to conventional raw materials are crucial for us," says Petschick.

For example, Continental works with partners to obtain high-quality polyester yarn for its tires from recycled PET bottles. PET bottles often end up in incinerators or landfills otherwise. With its ContiRe.Tex technology, the tire manufacturer has developed a more energy-efficient and eco-friendly alternative that allows it to reuse between nine and fifteen plastic bottles for each tire, depending on the tire size. Recycled PET has already replaced conventional polyester in the structures of some tire casings. The PET bottles used are sourced exclusively from regions with no closed recycling loop.

### **Systematically moving toward greater sustainability**

Continental is working tirelessly to advance innovative technologies and sustainable products and services throughout its entire value chain, from sourcing sustainable materials to recycling end-of-life tires. At the latest, the company aims to achieve 100 percent carbon neutrality by 2050.

**Continental** develops pioneering technologies and services for sustainable and connected mobility of people and their goods. Founded in 1871, the technology company offers safe, efficient, intelligent and affordable solutions for vehicles, machines, traffic and transportation. In 2021, Continental generated sales of €33.8 billion and currently employs more than 190,000 people in 58 countries and markets. On October 8, 2021, the company celebrated its 150th anniversary.

The **Tires group sector** has 24 production and development locations worldwide. Continental is one of the leading tire manufacturers with more than 57,000 employees and posted sales of €11.8 billion in 2021 in this group sector. Continental ranks among the technology leaders in tire production and offers a broad product range for passenger cars, commercial and special-purpose vehicles as well as two-wheelers. Through continuous investment in research and development, Continental makes a major contribution to safe, cost effective and ecologically efficient mobility. The portfolio of the tire business includes services for the tire trade and fleet applications, as well as digital management systems for tires.

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### Images and captions



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### Continental\_PP\_Sustainable\_Materials\_Car



Claus Petschick, Head of Sustainability at Continental Tires.

### Continental\_PP\_Claus\_Petschick