

Greener drives, Cleaner planet

How Sustainability is Shaping the Tire Industry

Adopted practices to reduce environmental impact

By Dorcas Kang'ereha

Sustainable practices are increasingly becoming a focal point in the tire manufacturing industry as companies are striving to reduce their environmental impact and embrace eco-friendly initiatives. Known historically for its resource intensive processes and waste generation, tire industry is now at the forefront of innovative solutions aimed at promoting sustainability.

With the current environmental challenges facing our world today, sustainability has become a necessity to help reduce greenhouse gas emissions, conserve our resources, protect our ecosystems, and create

a more resilient and responsible industry for the future.

"The tire manufacturing industry is increasingly adopting sustainable practices to reduce environmental impact. These practices focus on improving factory operations and designing eco-friendly tires to boost energy efficiency, better manage waste, and use more sustainable raw materials," says Martti

Päivinen – Head of Quality and Risk Management at Black Donuts Engineering Inc. (BDE).

Sustainable Materials and Sourcing Strategies

In a bid to reduce harmful environmental impact, tire manufacturers are turning to sustainable materials and responsible sourcing strategies. Incorporating renewable materials, like natural rubber and recycled materials such as steel and synthetic rubber into tire products, manufacturers are able to reduce their reliance on finite resources and in due course decrease the overall



manufacturers are making significant strides towards a greener future. "Several strategies exist to reduce the tire industry's environmental impact when designing tires. The most significant action is designing lighter tires," says Päivinen. "Lighter tires use less material, leading to less transportation of raw materials, a smaller warehouse, less compound mixing, shorter curing time, and less weight to transport new tires. However, this approach must balance weight reduction with maintaining durability and lifespan," he elaborates.

From incorporating natural rubber sourced sustainably to exploring innovative materials like soybean oil and orange peel extract, the industry is embracing new possibilities to reduce its carbon footprint, using materials that are renewable, recyclable, and non-toxic. These eco-friendly designs not only benefit the environment but also offer consumers a more sustainable choice when it comes to their vehicle's tires.

"Tire design aims for safety and low rolling resistance. This can reduce fuel consumption, increase tire lifespan, and minimize harmful particle emissions from tire wear. The industry is also now focusing on designing high-performance and quality tires specifically for the Electric Vehicle (EV) market, which demands longer-lasting and low rolling resistance tires," advocates Päivinen.

Enhancing Performance While Minimizing Environmental Impact

One of the key challenges in sustainable tire manufacturing is balancing performance with environmental impact. Manufacturers are utilizing advanced technologies and engineering techniques to improve tire durability, fuel efficiency, and safety while simultaneously reducing resource consumption and emissions. Optimizing tread patterns, sidewall designs and tire constructions, manufacturers are pushing boundaries to create tires that deliver top-notch performance without compromising on sustainability.

Carbon Footprint Reduction Measures

Reducing the carbon footprint of tire manufacturing remains a critical focus area for the industry. Investing in renewable energy sources and cleaner technologies is helping to lower carbon emissions associated with tire manufacturing operations. "Other emissions from tire factories also need to be controlled to reduce the environmental impact," comments Päivinen. VOC (Volatile organic compounds) emissions from tyre manufacturing are collected and treated, and dust and odours are filtered. Water is circulated as much as possible (cooling water) to reduce the need for water cleaning," he enlightens. Offsetting practices are also neutralizing carbon footprint through initiatives such as tree

planting programs.

Several leading tire manufacturers have responded by setting up individual initiatives to increase sustainable practices in the tire manufacturing industry, says Wróblewski. Many focus on replacing fossil-fuel-based virgin Carbon Black (vCB), which constitutes about 21-22 percent of tires. Tire manufacturers can replace up to 20 percent of vCB in tires with recovered Carbon Black (rCB) without any detrimental effect, limiting carbon emissions and ensuring less use of fossil fuels," he clarifies.

Spring Vent Mold Technology

The adoption of spring vent mold technology also contributes to material waste reduction. This technology reduces material waste during the tire curing process. During the curing process, an un-vulcanized tire, the 'green' tire, is placed into a curing press. As the mold closes, the air gets trapped between the mold and the tire. This is according to Päivinen.

"Without an escape route, trapped air would distort the tire and cause an undesirable appearance on the tire surface. Vents allow the air to escape. Spring vent mold technology is better because it closes automatically as the rubber fills the mold, reducing material waste. In contrast, a regular vent would leave excess rubber that needs to be trimmed away," asserts Päivinen.

Collaboration and Industry Partnerships for Sustainability



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Collaboration and partnerships within the tire manufacturing industry are essential for driving sustainability initiatives forward. Involving stakeholders such as suppliers, customers, government organizations, and environmental groups towards the sustainability efforts can amplify the impact on environmental conservation.

Seeking input, feedback, and support from diverse stakeholders, companies can develop comprehensive sustainability strategies that address a wide range of environmental issues. This collaborative approach ensures that sustainability initiatives are well-rounded, impactful, and aligned with the needs and expectations of various stakeholders.

Driving Industry-wide Change

Driving industry-wide change requires collaborative efforts and partnerships among tire manufacturers, industry associations, and regulatory bodies. Sharing best practices, resources, and knowledge, tire manufacturers can collectively work towards common sustainability goals. Collaborative initiatives such as industry-wide sustainability programs, joint research projects, and knowledge-sharing platforms play a vital role in accelerating the adoption of sustainable practices across the entire tire manufacturing sector.

Future Trends and Outlook in Sustainable Tire Manufacturing

As the tire industry continues to evolve, future trends indicate a strong focus on technological advancements that will shape the future of sustainable tire manufacturing. Anticipated developments and challenges in the industry has paved the way for exciting innovations and opportunities to further reduce the environmental impact of tire production. From the use of artificial intelligence and big data analytics to optimize production processes to the development of innovative materials and manufacturing techniques, technology is driving sustainable innovation in the industry. Manufacturers are investing in research and development to create smarter, greener, and more efficient tire solutions that meet the demands of both consumers and the environment.

"The tire manufacturing industry is making significant improvements in sustainability by focusing on energy

efficiency, waste management, innovative technologies, and sustainable tire designs. These efforts reduce the environmental impact and align with the growing demand for eco-friendly products," comments Päivinen.

With no doubt, the tire industry is making significant strides in adopting sustainable practices to minimize its environmental footprint and contribute to a greener future. It is through these collective efforts and commitment to sustainability that the tire sector is poised to make a positive impact on the environment while meeting the demands of a changing world.

Challenges such as regulatory complexities, market competition, and consumer awareness remain hurdles that the industry must navigate to achieve long-term sustainability goals. Staying agile, innovative and collaborative, tire industry can overcome these challenges and drive positive change in sustainable tire manufacturing.

