

Tyre Development Q&A: Why customers are at the heart of Continental's tyre designs

At a first glance, it isn't always obvious that a truck, bus, or van tyre has been optimised for a specific application. Operators could be forgiven for thinking that tyres, on the whole, all look the same. However, the process of creating the perfect tyre is highly scientific, blending physics, chemistry and product design principles.

Continental has a diverse portfolio of tyres, not least in the Commercial Vehicle sector. From construction and semi- off-road tyres, through to haulage, distribution and passenger-carrying vehicle rubber, each has a unique set of characteristics that deliver real-world performance, efficiency, and safety benefits for its customers.

To help shed some light on the process of designing and developing a tyre, Alexander Stangner, Head of Product Management Commercial Mobility at Continental Tyres addresses some of the commonly asked questions.

What do you consider before starting the tyre development process?

It's no secret that our customers' needs are a core factor when it comes to the development of our tyres. Whether operators are seeking a tyre that offers low rolling resistance, or one that delivers a high mileage performance, each tyre is designed to speak to their requirements. For instance, vehicles operating on building sites require tyres that sport a tread pattern and sidewall with enhanced durability – a characteristic mostly relevant only to the specific application.

Other performance criteria are outlined in our requirement book, such as low tyre noise, aquaplaning safety and braking performance in dry, wet, and snowy conditions. Certain legal requirements must also be fulfilled, such as pass-by noise, wet braking, and rolling resistance standards, as well as several criteria around lifespan. Retreadability is also a key consideration when developing a tyre for commercial use. This is in addition to cost-saving potential and sustainability – all of which are significantly important to our customers.

How does compound contribute to the design choice?

As the tread compound is responsible for adhesion to any surface at a microscopic level, it directly influences the design. It's also important to note that tread compound has a particularly high influence on tyre wear and rolling resistance. Both the compound and tread need to be synchronised and fine-tuned in order to achieve the desired performance. We also cannot forget the carcass construction, which is another significant contributor to the overall performance of a tyre.

Are tyre tread patterns always designed from scratch, or are they an evolution of previous designs?

Although we don't always start with a blank canvas, when it comes to designing a tyre, we do refer to the core design principles for every new tyre. In some cases, we may blend a known pattern with a new rubber compound, or vice versa. Ultimately, it's producing something that we think best serves that specific requirement book. For brand new tyre

lines, however, a new, dedicated tread formulation is needed, which requires a completely original design.

Regardless of originality, the tread is a very important element in achieving our performance criteria, as it's the part of the tyre making direct contact with the road surface. It's also the tread pattern that is responsible for the drainage of the contact area and provides the grip needed to tackle differing terrains and weather conditions.

For adverse conditions, such as snow, a tread pattern with multiple sipes is optimal, while a pattern with little flexibility is required for high mileage performance and outstanding handling characteristics.

How much testing is involved in the tread design process?

We must never underestimate the importance of testing. It's a crucial stage in the tread design development process, as it not only justifies our aims for the tyre, but also ensures legal compliance. We'll typically test a number of different design candidates as part of a test loop, evaluating the response of each. It's very much a process of refine, test, refine until we're satisfied with the product we've created. We're also further developing and testing tyres virtually to make them even more efficient and sustainable. Naturally, testing is completed in consideration of the customer and legal performance criteria.

How long does the entire development process last?

The duration of the development process varies greatly. It mostly depends on the product development target and how specific the design is. An average would be somewhere between two and five years, depending on how much development is needed above that of the previous tyre.

To find out more about the development of Continental's tyres, visit: [\[LINK\]](#)

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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 2022, Continental generated sales of €39.4 billion and currently employs around 200,000 people in 57 countries and markets.

The **Tires group** sector has 24 production and development locations worldwide. Continental is one of the leading tyre manufacturers with 57,000 employees and posted sales of €14 billion in 2022 in this group sector. Continental ranks among the technology leaders in tyre 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 tyre business includes services for the tyre trade and fleet applications, as well as digital management systems for tyres.



Press release

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