A visionary tyre for future autonomous vehicles

Goodyear has seen the future – and it's spherical. But how would the company's concept tyre work?

We have seen many glimpses into what autonomous vehicles may look like in the future, but what about other vehicle components? What about tyres? What role will they play in autonomous driving? According to Goodyear's senior vice president and chief technical officer, Joseph Zekoski, by steadily reducing driver interaction and intervention in self-driving vehicles, tyres will play an even more important role as the primary link to the road.

At the Geneva International Motor Show Goodyear unveiled its vision of a future tyre that looks radically different from tyres today – it's a sphere.

Spherical shape for ultimate manoeuvrability and safety

The unique shape of the Goodyear Eagle-360 could contribute to safety and manoeuvrability to match the demands of autonomous mobility. The multi-orientation tyres move in all directions, contributing to passenger safety. Active technology allows the tyre to move as needed to reduce sliding from potential hazards, such as black ice or sudden obstacles, so it contributes to staying on a safe path.

In addition, the spherical shape of the Goodyear Eagle-360 provides a smooth ride by creating a fluid, lateral movement. This helps the car to overtake an obstacle without changing its driving direction.

Finally, because 360 degree turns are possible with this tyre, it could tackle anticipated parking constrictions of the future, as less space will be needed for cars fitted with spherical tyres to pull into parking spots.

Connected via magnetic levitation

To connect with the body of the car, the Goodyear Eagle-360 concept tyre relies on magnetic levitation. The tyre is suspended from the car by magnetic fields, similar to magnetic levitation trains, which increases passenger comfort and reduces noise.

Sensors ensure connectivity with car and increase safety

Sensors inside the Eagle-360 concept tyre register the road conditions, including weather and road surface conditions, and communicate this information to the car as well as to other vehicles to enhance safety. Secondly, leveraging Goodyear's tread wear and pressure monitoring technology, sensors in the Eagle-360 register and regulate the wear of the tyre to extend mileage. Finally, because the tread is produced by a 3-D printer, customizing the tyre based on the region where the driver lives is a new possibility.

Biomimicry – inspired by nature

The tread design of the Eagle-360 mimics the pattern of brain coral and its multidirectional blocks and grooves help to secure a safe contact patch. The groove bottom has the same elements as a natural sponge, which stiffens when dry yet softens when wet to deliver adequate driving performance and aquaplaning resistance. This texture also absorbs water on the road and ejects water from the tyre footprint through centrifugal force to reduce the risk of aquaplaning.

"Though this is purely a concept tyre, it showcases some of Goodyear's best innovative thinking and how the needs of future drivers can be addressed. Based on our own recent research*, we know that young drivers are looking for smart and sustainable cars to be part of future mobility and that reliability and safety are key for them. We believe the Eagle-360 concept tyre could deliver a safe and sustainable solution for our end-consumer who is likely to drive or ride in autonomous cars in the future," said Jean-Claude Kihn, president of Goodyear EMEA.

*Source: Goodyear and Think Good Mobility: Millennials' Views on the Future of Mobility in Europe: https://drive.google.com/file/d/0B1HvJzTnvhLfc0dOYWJtTnBfUTA/view

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