Goodyear Unveils a Concept Tire for Flying Cars

*AERO tire would work as a wheel on the ground and a propeller in the air*



Goodyear unveiled its AERO concept tire for flying cars at the Geneva International Motor Show in Switzerland. The tire would convert into a propeller for flying.

The AERO is a tilt-rotor tire that facilitates a seamless transition from ground to air travel. Instead of a rigid wheel, the tire features fanlike spokes.

“The individual blades absorb shocks while driving on the road but also act as robust rotors to create vertical lift when the tire is tilted,” said Daniel Hinque, an engineer at Goodyear who helped develop the tire.

The solid airless tire is flexible enough to dampen bumps in the road while being strong enough for the high-speed rotation needed for the rotors to create vertical lift. That rotation would be achieved by using magnetic force to generate frictionless propulsion.

The AERO is equipped with light-based fiber-optic sensors to monitor road conditions, tire wear and structural integrity. It would use artificial intelligence (AI) technology to combine and analyze sensor information and communications from other cars and nearby infrastructure.

The AI processor would then recommend a course of action—including when to switch between flying or driving mode—and anticipate, identify and resolve potential tire issues before they become a danger.

“With mobility companies looking to the sky for the answer to the challenges of urban transport and congestion, our work on advanced tire architectures and materials led us to imagine a wheel that could serve both as a traditional tire on the road and as a propulsion system in the sky,” [said](https://news.goodyear.eu/the-goodyear-aero--a-concept-tire-for-autonomous-flying-cars/) a company news release.

But the AERO has some [skeptics](https://www.nbcnews.com/mach/science/goodyear-unveils-flying-car-tire-concept-works-ground-air-ncna980066). According to Pat Anderson, director of the Eagle Flight Research Center at Embry-Riddle Aeronautical University, while combining two components in one might reduce the number of parts, they typically result in compromises that lower performance.

“You've seen cars that are supposed to turn into boats, but it’s not a good boat or a good car,” Anderson said. He added that the downwash from the fast-spinning tire in flight mode might be dangerous to people or objects below the car and cause excessive noise.

Ella Atkins, professor of aerospace engineering at the University of Michigan, is reminded of the solid rubber tires used by the first automobiles.

“How safe and efficient can a car be with Model T tires in car mode even with 21st century sensors and electronics?” she asked.

While the AERO is still just a concept, technologies like a non-pneumatic structure and intelligent tire capabilities are already in development. Goodyear seems to sense the growing shift from conventional ground-based cars to flying ones and is aiming to be an innovator in that growing market

**Q-Are aircraft tires made of the same material as car tires?**

Chemically; yes

Physically; no

Aircraft tires are manufactured to much higher standards and specifications. They are also filled with nitrogen instead of regular air. This helps with corrosion on the inside of the rim. Many modern cars are now adapting to this standard. Rotational speed is also a concern for aircraft that many cars don’t have to worry about. Yes, there are “speed rated” tires for cars, but they are not standard. There is also a difference in the composition of the material that they are made out of. Aircraft tires have to be able to withstand harsh landings and the tires still be intact. This makes the manufacture standards much more stringent. There is also usage. Because aircraft use tires that are created for “harsh use” they are much tougher than regular car tires. They also have to be concerned with aerodynamics when it flight. Even the slowest airplane flies much faster than any car can ever hope to attain. What I am talking about is ‘wind resistance”. Chemically they are made out of the same rubber and steel, but Aircraft have to be much stronger and have far more longevity.

The aircraft tire is a combined structure of these basic materials:

1.    Rubber

2.    Nylon

3.    Cord

4.    Steel

These tires are combined together by a vulcanization process. Vulcanization process is a chemical process for converting polymers into more durable materials by introducing crosslinks. This process of treating crude or synthetic rubber or similar plastic material chemically to give it useful properties (such as elasticity, strength, and stability). There are mainly two types of tires:- Radial and Bias, each type has unique components reflecting different technologies applied to design, compounds and materials. To understand the difference between these two different types of tires, you have to first understand the meaning of ply rating. Ply rating is a rating of how many layers of rubber is on a tire. The number of layers of rubber and the angles at which they are laid dictate the strength and load capacity of the tire.