

Frequently Asked Questions

1. What is Uptis and what advantages does it offer?

Uptis (acronym standing for “**Unique Puncture-proof Tire System**”) is an assembled **airless wheel structure**. Uptis has been made possible through Michelin’s mastery and expertise with tire mechanics and high-tech materials. It also represents an evolution of Michelin’s expertise in TWEEL technology. Uptis can be thought of as the first in a new generation of airless solutions. This technology for passenger vehicles offers a number of advantages:

- Car drivers feel safer and more secure on the road due to the reduced risk of flat tires and other air loss failures that result from punctures or road hazards.
- Fleet owners and professional vehicle drivers optimize their business productivity (no downtime from flats, near-zero levels of maintenance).
- Raw material use is reduced, which in turn reduces waste.

2. Why do car drivers feel more at ease with Uptis?

Uptis is designed to be impervious to traditional tire failures due to air loss. It does not use compressed air. It therefore eliminates the need for regular inflation pressure maintenance.

3. What is the strategy behind Uptis?

Uptis represents Michelin’s vision for the future of mobility. Michelin illustrated its vision of sustainable mobility through the Vision concept¹, which the Group unveiled at the Movin’On World Summit on Sustainable Mobility in 2017.

Uptis shows how Michelin is adhering to its roadmap for research and development, which comprises these four main pillars of innovation: Airless, Connected, 3D-printed and 100% Sustainable (i.e., renewable or bio-sourced materials).

With its airless Uptis, Michelin demonstrates **that its vision of future mobility is an achievable dream**.

Intended as a mainstream product as early as 2024 and developed in collaboration with General Motors (GM), Uptis marks the **first fundamental step** in Michelin’s journey toward achieving its sustainable development model.

4. How is Uptis different from Tweel?

Uptis is the first in a new generation of Tweel technology.

Uptis is derived from the [MICHELIN Tweel technologies](#) and shares some design concepts in common — a tire-wheel assembly, “spokes” that carry the load and a sheer beam outer ring, among others.

¹ <https://michelinmedia.com/c/michelin-vision-concept-tire/>

Although Uptis outwardly resembles Tweel, its structure and materials represent a technological breakthrough. These innovations replicate the functions of a traditional tire, without the inflation pressure required to achieve the target performances. Uptis is re-engineered for handling and maneuvering at highway speeds. Simply put, Uptis is tuned for the requirements of passenger vehicles.

Tweel was introduced in 2004 and industrial production started a few years later. Michelin has achieved a 10-year-plus advantage in its abilities to manufacture these technologies at scale for mainstream passenger-vehicle applications. Without Tweel, Uptis would not be here today.

5. The market offers several different airless products. What makes Uptis unique?

Uptis introduces breakthrough advances in design and composite materials that allows Uptis to support the weight and high speeds of a passenger car, with a comfortable and responsive ride that's comparable to zero-pressure (also known as "run-flat") tires.

6. Why was General Motors selected as a partner?

Together, Michelin's and GM's long-term development ambitions are aligned. Today, GM is a leader in a new transformation, one that will create a safe and smarter world, and GM's ambitious plan of zero crashes, zero emissions and zero congestion drives every decision the company makes. Together, Michelin and GM are leading the automotive sector in this direction.

GM is the first original equipment (OE) manufacturer with a joint research agreement to advance the development of Uptis. Michelin is excited about the "first-mover" opportunities the partnership creates. Michelin is evaluating a very limited number of other partnerships allowed within the context of the first agreement with GM.

7. Is Uptis durable?

Uptis, as designed, is robust but not indestructible. Uptis can withstand much greater shocks and impacts than a traditional tire, and greater impacts than other wheel solutions. Michelin is also advancing research to enable the airless wheel assembly to accept multiple retreads (i.e., the rechargeable or 3D-printed pillar of innovation in the Vision concept), which would extend its total lifespan dramatically and deliver many more maintenance-free miles than a pneumatic tire for passenger vehicles.

8. Will drivers notice the difference between Uptis and a standard tire?

It's not likely. Uptis improves the vehicle's performance without compromising comfort. Uptis performances are comparable to a zero-pressure ("run flat") tire.

A standard pneumatic tire and wheel typically weighs nearly 21 kg, while a mounted zero-pressure ("run flat") tire can weigh up to 23 kg. Uptis currently weighs about 22.5 kg.

Uptis can also yield overall vehicle weight reductions by removing the need for a spare tire, jack or tire pressure monitoring systems that exist in most vehicles today.

9. Will Uptis impact the fuel efficiency of my vehicle or range for electric cars?

Today's level of rolling resistance is about the same as a zero-pressure ("run flat") tire, i.e., 8 kg/t. So one can expect the same fuel efficiency when switching to Uptis from a run flat tire. This performance will improve with future developments in design and materials for Uptis. Fuel efficiency of traditional tires is affected by pressure loss, which will not happen with Uptis.

10. Is Uptis street-legal today?

Except for use as a spare tire, there are no current national standards for airless tires used on open roads like motorways or highways.

Many players involved in the tire production business (from manufacturers to government bodies) are currently working to define a standard and start certification. (In the U.S., policy discussions will build on Federal Motor Vehicle Safety Standards [FMVSS] 129 and 139, which include non-pneumatic spare tires.)

Michelin is pursuing a state-by-state approach at this time because at the national level the U.S. has not established federal motor vehicle safety standards for the airless wheel assembly. Michelin has obtained state-level permission for open-road testing in several U.S. states.

11. What is Uptis made of?

Uptis is principally made of rubber, aluminum (for the wheel) and a new high-performance composite material referred to as "resin-embedded fiberglass."

In the space of several years' work on resin-embedded fiberglass (REF), Michelin has filed around 50 patents on materials, manufacturing processes and applications (e.g., Tweel, Uptis, tires, lunar wheels and more).

12. When is Uptis expected to be available in the market?

Michelin and GM expect the Uptis solution will be operational and available as an option for select GM models as early as 2024.

13. When will Uptis be available through dealers as a replacement tire?

After-market retail availability for Uptis is expected to follow production vehicle launches.

14. When will Uptis be available to other original equipment manufacturers?

Michelin is currently in discussions with other automobile manufacturers.

15. How much will Uptis cost?

Uptis pricing is not set. Cost will depend on application and volume. The product will be competitive with other innovations, while also recognizing game-changing features and benefits — no more flat tires.

16. In which countries will Uptis be put on the market first?

No decision has been made at this stage. The choices will be evaluated in the framework of the co-development process with automobile manufacturers.

17. On what other models of vehicle could Uptis also be marketed?

No decision has been made at this stage. The choices will be evaluated in the framework of the co-development process with automobile manufacturers.

18. Can the central aluminum structure be re-used once the rubber is worn or damaged?

Yes.

19. Can we replace the central aluminum structure to suit our own taste in wheel design?

Yes.

20. What is the estimated mileage?

Uptis will have the same mileage of a standard tire.

21. What will happen if some small stones or mud or snow get in between the structure of Uptis?

The objective during the development of the commercial product is to test Uptis in all of these situations. Some preliminary tests show that stones, mud or ice/snow will not stay inside the Uptis structure.