

## The Tweel Tire/Wheel

When it comes to transportation, where the rubber hits the road, wheels and tires look basically the same as they did when the pneumatic bicycle tire was first introduced around 1888. Michelin, the company that produced the first pneumatic automobile tire in 1895, has recently introduced a totally new wheel/tire combination.

The diagram at right shows a rubber tire tread directly bonded to a polyurethane spoke assembly, with the spoke assembly then directly bonded to a flexible wheel. Since the tire and wheel are all permanently bonded together, Michelin named its new tire/wheel design the "Tweel T."

As the Tweel T turns, its spokes and rubber tread deform to take the shape of the road. Tweels handle potholes and other road hazards by deforming in much the same way a pneumatic tire does. But they function without any possibility of getting a flat from a puncture or having a blowout, which can lead to a catastrophic accident. The Tweel also has the same weight-carrying capacity, tire tread performance and passenger comfort as regular pneumatic tires—and you don't have to worry about over- or underinflation.

The Tweel's availability will first be limited to use on Dean Kamen's iBot wheelchair, industrial equipment and off-road vehicles. The iBot wheelchair incorporates the same balancing technology as Kamen's Segway, and testing has shown that a set of Tweels can enhance an iBot's ability to climb and descend a flight of stairs.

The military is now experiment-

ing with Tweels on military vehicles. So far, testing has shown that these tires can continue to roll long after pneumatic tires fail due to damage



Components of the Tweel T

from landmines or small weapons fire. Military testing has also shown that the Tweel's open structure doesn't encapsulate a landmine's explosive force. Channeling some of the energy (which would have been contained by a conventional tire) away from a vehicle gives its occupants a little more protection.

Michelin expects the tread on a Tweel to last three times longer than the tread on a normal radial tire. When it does wear out, the remaining tire tread can be removed and a new tread bonded in its place. Michelin is already testing the Tweel on automobiles.

After seeing Tweels on an Audi A4, I contacted Lynn Mann, Michelin's North American director of public relations to find out if Tweels will see general introduction into the automobile marketplace

within the next 5 to 10 years. Mann said that "introduction into the passenger car market is a very long-term possibility—more than 10 years away. Michelin currently intends to enter the market with low-speed, low-weight carrying vehicles, like iBOT and in time Skidsteer, applying our knowledge from these early successes to additional development for applications like passenger cars."

Having explored new inventions and innovations for the last 40 years, I have come to the conclusion that "new technology" isn't actually the inventions and innovations that creative people develop. It's what customers, clients and the general population adopt. Andre Michelin's first venture into pneumatic tires in 1895 wasn't so successful. My guess is that Michelin will take its time to let people get used to an entirely new tire design before the company tries to put them on your family vehicle.



Spokes and tread deform to take the shape of obstacles.

### Recalling the Facts

1. Describe how a Tweel differs from a conventional wheel and tire.
2. Using the diagram of the Tweel, explain how it changes shape to take the contour of the road.
3. Would you purchase a vehicle if it had Tweel wheels? Why? ©

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