

Tyrata Technology Backgrounder

Intelligent Tread Wear SystemsSM

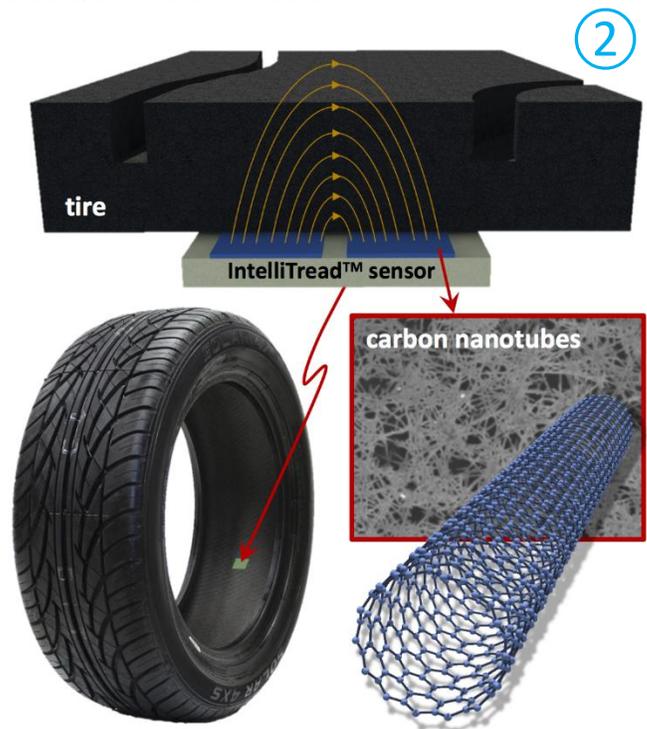
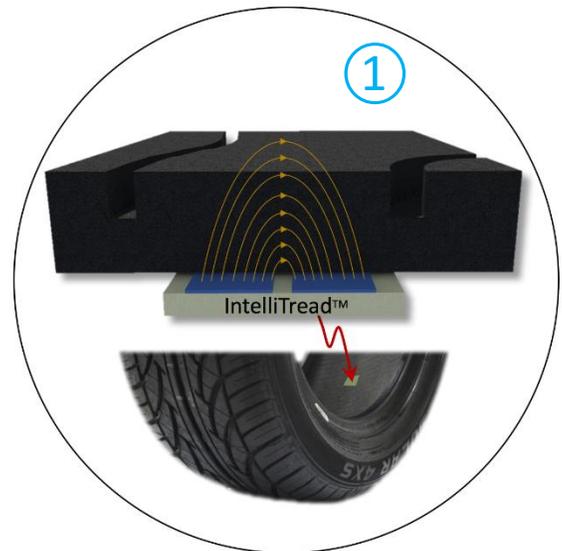
Tyrata, Inc. is a sensor development and data management company offering wireless sensors and systems that monitor and report on vehicular tire tread wear in real time. Tyrata's IntelliTread™ technology monitors, tracks and predicts tire tread wear over the life of a tire.

In collaboration with Duke University, Tyrata's founders developed the sensor technology using carbon nanotubes (tiny cylinders of carbon atoms just one-billionth of a meter in diameter) that allow for millimeter-scale changes in tread depth to be measured. The sensors could easily signal when it's time to replace tires or report information about uneven and often dangerous tire wear conditions.

The technology relies on the well-understood mechanics of how electric fields interact with different materials. The core of the sensor is formed by placing two small, electrically conductive electrodes side by-side, on the inside of the tire, directly below the tread (1). Importantly, the sensor can operate without being embedded into the tire's tread, making it applicable to any tire at the time of installation (2). By applying an oscillating electrical voltage to one electrode and grounding the other, an electric field forms between the electrodes.

While most of this electric field passes directly between the edges of the two adjacent electrodes, some of the field arcs from the face of one electrode to the face of the other, with the arc penetrating up into the tire tread. The tire rubber and tread structure interfere with this so-called "fringing field" and by measuring this interference through the electrical response of the electrodes, it is possible to determine the thickness of the tire above the sensor.

While there is a limit to how thick a material this setup can detect, it is more than enough to encompass the centimeter or two of tread found in today's tires. Testing of the sensors on consumer and commercial tires has provided evidence of millimeter resolution, which means that the technology could easily tell drivers when it's time to buy a new set of tires. In a more sophisticated implementation, the technology could provide information about uneven and often dangerous tire wear by connecting numerous sensors in an array to cover the width of the tire.





Importantly, tests have also proven that the steel belts (metal mesh) embedded within tires do not prohibit the operation of the sensors.

While the sensor could be made from a variety of materials (including carbon nanotubes, CNTs, that provide a boost in sensitivity) and operated using many methods, Tyrata's researchers have optimized performance by controlling sensor materials, design, and electronic measurement technology. The result is the IntelliTread™ sensing technology, which delivers the first direct measurement of tire tread thickness using wireless signals.



Headquarters Location

Based in Durham, North Carolina

Tyrata, Inc.
101 West Chapel Hill St
Suite 200
Durham, NC 27701

Media Contact

Garth Miller, garth.miller@allbusmarketing.com +1 919-923-3505