BUSINESS

Explanation on what graphene brings to tyres, carbon wheelsets & frames, textiles, and e-bike components

Vittoria To Start a True Cycling Revolution

LOMAZZO, Italy - The claims are big. It’s said to be magical, revolutionary, and even comparable to the invention of plastic. We’re talking about graphene. The fact that the two scientists who invented it were awarded the Nobel Price in 2010 indicates there’s some substance to the hype. The same goes for the €1 billion subsidy the EU has available for developing applications. Graphene has now made its entrance in the bike industry.

Jack Oortwijn

How it made its entrance was made clear last October during a visit to high end tyre maker Vittoria and to Directa Plus, the company that in June of 2014 opened “The graphene Factory”, the largest European industrial production unit for pristine graphene nanoplatelets. Here it was shown what integrating graphene into tyres and composite material for carbon wheel sets brings Vittoria. And it’s possible other companies in the bike industry will be integrating graphene, as it brings unprecedented features to carbon frames, other composite products, textiles, as well as electric (e-bike) parts – because graphene is also a superconductor.

Changing the tyre recipe

Integrating graphene into Vittoria’s tyre compounds or composite materials like carbon fibre, textiles and other products is what it is all about. It’s definitely not like adding powder or carbon black to tyre compounds. It is in fact coming on top of carbon black and the Directa Plus and Vittoria people now working for years with graphene say, “Unique is that graphene has the ability to bond on an atomic level with other materials. With this dissolution graphene is able to manipulate the shape of particles in various materials.” It took Directa Plus and Vittoria about 4 years to get that dissolution process well established in 4C (4 compound) tyres. And in particular in such a way that the two companies now say that they changed the recipe for making tyres. It results in what Vittoria calls a game-changer as their tyres are now “intelligent.”

Intelligent tyres

The unlocking of the properties of graphene in combination with rubber is resulting in compounds that become harder and softer, depending on the needs of the rider. Vittoria claims, “If the tyre is rolling straight, the rubber is at its hardest and offers low rolling resistance. If the rider brakes, accelerates or corners, the compounds soften and offer significantly more grip.” Additionally, Vittoria says it has achieved major improvements in durability and puncture resistance for its graphene-enhanced range, which is called Intelligent Tyre System (IT’S). Vittoria’s new Corsa Speed (Tubeless ready) with graphene has been measured at 40 percent less rolling resistance compared to the same product without graphene. According to Vittoria, elaborate independent testing clearly proves it is the fastest tyre in the world. “The new Corsa has 19 percent less rolling resistance compared to the same product without graphene. In combination with the most flexible Aramid-enhanced cotton casing ever developed, this product is the best performance tyre in the world overall.”

Graphene enhanced E-MTB tyres

Unprecedented features come also when graphene is used in (electric) MTB tyres. In particular as the increased strength allows the tyres to resist damaging of the tread and knobs due to the added acceleration torque of MTB electric motors in the new products e-Corsa and e-Barzo. For regular electric bikes the new Vittoria tyres with graphene allows for longer battery life in urban usage, due to greatly reduced rolling resistance. The new Revolution offers fast-rolling comfort on any bicycle and, claims Vittoria, truly excels on e-bikes. Vittoria introduced graphene-enhanced carbon wheels for high performance road and MTB wheels in 2014. They are also said to reach new heights. “With the application of graphene, the natural properties of carbon are pushed in lateral stiffness, impact strength, weight reduction, and heat dissipation. The features of carbon are now extended to withstand the high pressure of tubeless mounted tyres even under heavy braking circumstances.” Vittoria will soon launch full carbon clinchers that can be mounted as a tubeless system. Next to that there are much more graphene enhanced products to come in the next years.

More on this wonder material can be read on the next page.

New Factory for Graphene Enhanced Tyres and Wheelsets

In January 2013, Vittoria opened a $11 million compound factory. Here Vittoria is the first to produce on an industrial scale and use graphene for both bicycle tyres and carbon wheels. In addition to the factory’s core activities in the Vittoria group, it is also the selected manufacturer for the high performance products of many renowned cycling brands (Michelin, Specialized e.g.).