Vittoria Group Ltd. President Rudie Campagne on the application of graphene in cycling products: ‘The Leap Forward in Key Performance Areas’

LOMAZZO, Italy – Vittoria President Rudie Campagne came into contact with graphene some five years ago. Since then, it took him, “On a complex journey to unlock the potential benefits of graphene with rubber”. Now he hopes to enjoy the first-to-market advantage. But only for the time being, as he expects many key cycling industry players will also embrace the usage of graphene soon enough.

JACK OORTWIJN

There are not a lot of people that know about graphene and its remarkable features. How did you come to know about it?

A few years ago I met this great Italian entrepreneur, Giulio Cesarea, at a business event. He is the founder and CEO of Directa Plus, a company that manufactures graphene. At this time, I also was not aware of the existence of graphene, so Giulio explained that this revolutionary new material was in theory the best material known in the world of science. We continued the conversation after the event and decided to explore the potential benefits of graphene for the cycling industry together. It has been a unique and complex journey ever since we started to collaborate in 2009. Now our joint efforts are delivering cycling tyres and wheels with a performance level that has not been seen before.

In various Vittoria press releases it is said that graphene is to bring about a revolution in cycling. How will this take place?

Vittoria believes that the introduction of graphene in cycling products is one of those rare and irreversible trends. Once people experience the benefits of the added graphene, they will continue to use products with this unique material. Because of the leap forward in key performance areas (speed, grip, strength, durability etc.) we are convinced it is inevitable that many other key players in the industry will also start using graphene, thus starting a revolution in cycling.

Looking at your investments in for instance the new compound factory in Thailand, which is processing the graphene material in tyre compounds, you are very confident in the success that adding graphene will bring for the tyres and carbon wheels you produce. Why?

In all fairness, expanding the compound expertise was always going to be a great investment for Vittoria, with or without the successful addition of graphene. We simultaneously invested in a four-headed extruder, which allows us to precisely place four different compounds in a tyre tread for optimised benefits of each material in the right area. Our confidence in graphene developments was inspired by the great material properties itself, but our investment in the compound factory was not a single-minded gamble.

In January 2013 you opened the graphene compound factory in Thailand. Last October Vittoria launched its Intelligent Tyres made with graphene. Did it take longer than expected to integrate graphene in the compounds in such manner that all graphene’s favourable features are triggered? And why did this take so long?

It was never a certainty that Vittoria and Directa Plus would be able to unlock the potential benefits of graphene with rubber. In that sense, we were not able to schedule a specific time-to-market strategy at any point until we saw the first positive impact in our test results. Of course we were hoping to see an immediate result, but our knowledge of compound research and development already taught Vittoria to be patient.

So, adding graphene to compounds or to carbon fibres is not just like adding powder?

On the contrary. It is a very exact material science where you must create a proper balance and achieve the desired dispersion of the graphene platelets inside the matrix material. The application process details of graphene in both rubber and carbon are well-guarded secrets, like the recipe for Coca-Cola.

As a private label producer Vittoria also makes tyres for the world’s biggest brands. Do you offer the graphene technology to your private label customers?

Not at this moment. Vittoria has invested a lot in the development and will enjoy the first-to-market advantage for the time being. As mentioned, we expect many key cycling industry players to embrace the usage of graphene soon enough. Vittoria will simply carefully consider the timing of offering this ability but it is clear that we will share this technology eventually with others to create a new standard for materials and better product performances.

There’s special mention of graphene-enhanced compounds for e-MTB tyres. What effects does this material bring to this specific category?

Traditional mountain bike tyres are clearly not optimised to deal with the acceleration torque of such bikes, resulting in significant tread damage especially at the base of the knobs. We decided to start up a special project for this purpose, to investigate if we could use graphene to add strength in the desired areas for this category of bikes. We were able to address both the tread damage issue from acceleration torque as well as the greatly improved resistance to general wear and tear. The E-Barzo and E-Gioma are the first end results of this special Vittoria project.

Vittoria also uses graphene in carbon wheels. Can it be used in composite frames?

The simple answer is yes, graphene has a significant positive impact on carbon and therefore composite frames could benefit equally from the improved properties. As I mentioned, Vittoria created a special project for e-MTB and any frame builder would need to do the same to investigate how to get the most out of the addition of this material. Again, precise material expertise is required to unlock the different positive properties of graphene in the right areas of the frame for ultimate performance improvements.

Next to tyres and carbon wheels what other applications in two-wheeler products are possible when it comes to adding graphene to get the best features?

Basically, Vittoria and Directa Plus have found the right application process for rubber and carbon. All two-wheeler products that use these materials can be improved with the use of graphene. Of course the development won’t stop there and the research on new application processes with different partner materials for graphene continues.

I can imagine that with the multimillion investments you made you have also made agreements on exclusive distribution in and outside Europe with your graphene production partner?

Yes, this is correct. Because Vittoria is one of the first companies worldwide that has managed to launch commercial products that contain graphene, it makes sense that companies reach out to benefit from the insights that Vittoria and Directa Plus have gained.

Where will graphene be by the end of this decade; by the end of 2020?

My best guess is that material scientists will manage to unlock a number of additional applications for different materials, beyond rubber and carbon.