Heat-dissipating shoes with graphene soles

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The ability of graphene to add functionality to common objects has been exploited in footwear with better thermal properties. Developed by Graphene Flagship partners Istituto Italiano di Tecnologia, Italy, in collaboration with FADEL, a leading Italian shoe company based in Tuscany, the new GET technology gives the footwear better thermoregulation and freshness.

In this innovative shoe, flakes consisting of several graphene layers are added to polyurethane used in the soles. Laboratory tests show an augmented heat dispersion, greater waterproofing and enhanced antibacterial properties. Combining these effects with a ventilation system provided a better user experience. This prototype shoe was presented at the International Footwear Exhibition in Milan.

"One of the main properties of graphene is its ability to dissipate heat, so we began to think of combining graphene produced by liquid phase exfoliation into polyurethane—the material used for the sole of the shoe. This created a composite with a heat dissipation 50 percent better than the pure polyurethane material," said Vittorio Pellegrini, Director of IIT Graphene Labs and Chair of the Executive Board of the Graphene Flagship. "We improved the thermal properties with a tiny amount of graphene (around 1 percent) which is significant in delivering a product whose cost is not significantly larger than before."

"The Graphene Flagship is a strong accelerator of knowledge, knowhow and technology transfer." said Pellegrini "Without the Flagship, this shoe would have taken many years to develop. We benefited greatly from the

ability to share our results and get ideas from other scientists through the Flagship."

Dr Kari Hjelt, Head of Innovation for the Graphene Flagship said "We continue to witness the potential of graphene-based technologies to create market disruptions and transformational innovations. Graphene's unique capability to enhance multiple product attributes concurrently can create a competitive edge for many products, as is nicely demonstrated in the present case."

Professor Andrea C. Ferrari, Science and Technology Officer of the Graphene Flagship, and Chair of its Management Panel, added "This is yet another example of the steady journey of graphene and related materials from the lab to the factory floor. With an ever increasing number of companies working as partners or associate members of the Flagship, the Flagship is not only pushing the state of the art of graphene and related materials' science and technology, but is also driving the innovation."

Further information on the above project, developed by Graphene Labs of IIT and the Italian shoe company FADEL can be found at the website http://www.freshoes.it

More information: For more information, see www.freshoes.it

Provided by Graphene Flagship