This Graphene-based Cabin Suitcase is Just Too Good to be True

2019-10-29

The University of Manchester in collaboration with GraphCase, a British start-up company, successfully produced a working prototype of a smart suitcase designed based on a patent-pending technology, in which a polymer composite is prepared using fully recycled plastic and graphene. This innovative graphene-based suitcase has absolute superiority over conventional suitcases in terms of being 60 percent stronger yet 20 percent lighter with a lifetime warranty; moreover, at the end of its lifetime, it can be recycled multiple times without its quality being affected.

A prototype for a graphene- based smart suitcase made of 100 percent of recycled plastic has been developed in collaboration with The University of Manchester.

400 million tonnes of plastic is produced every year in the world with 40 percent of that single use and only 9 percent get recycled worldwide. Furthermore, it is predicted by 2050 that the amount of plastic in the ocean will be greater than the amount of fish.

One of the barriers for using recycled plastic includes degradation and thermal aging of the plastic as well as mixing low-grade materials into the batch, which results in poor performance properties and lower reusability.

However a Manchester-based start- up company, GraphCase has developed a patent pending technology to create a composite polymer using graphene, which is made from 100 percent recycled plastics. The world first graphene suitcase is 60 percent stronger, 20 percent lighter and has a lifetime warranty. The material used can also be recycled multiple times whilst maintaining its performance. The use of one 20" GraphCase cabin luggage could potentially reduce 6 kg CO_2 emissions into the environment.

The graphene-enhanced recycled polycarbonate system imparts smooth-touch, scratch resistant and better impact properties. The case also includes an ejectable battery pack so mobile devices can be charged (on the go) a TSA approved lock as well as being water

resistant.

"Plastic pollution is one of the greatest environmental challenges at the moment. We all have to do our bit to save the environment. By adding graphene to recycled plastics, it was possible to develop 60 percent stronger and 20 percent lighter travel case with 50 percent less CO2 emission," says Dr. Nazmul Karim.

Going forward, GraphCase is working with the ERDF Bridging the Gap Programme to take this concept forward. Funded by the European Regional Development Fund (ERDF) the project has been developed to proactively engage Greater Manchester (GM) based SMEs and new ventures to allow them to overcome challenges, and explore and apply graphene and other advanced 2-D materials in a wide range of applications and markets.

Dr. Shaila Afroj, co-founder of GraphCase and former University of Manchester student, said, "Over the last several months we have worked extremely hard with Graphene Engineering and Innovation Centre (GEIC) at The University of Manchester and various partners to develop World first Graphene-enhanced travel case based on 100 percent recycle plastics. We are hoping to bring our smart, strong and environmentally sustainable travel case to the market in the new year. By providing high quality, extremely durable and 100 percent recycled plastics-based suitcase, we would like to provide greatest experiences to the travellers."

Dr. Nazmul Karim, the other co-founder of GraphCase said "Plastic pollution is one of the greatest environmental challenges at the moment. We all have to do our bit to save the environment."

By adding graphene to recycled plastics, it was possible to develop 60 percent stronger and 20 percent lighter travel case with 50 percent less CO2 emission. We are not stopping there, as the plan is to bring a range of graphene-enhanced environmentally sustainable recycled materials-based products to the market."

Graphene-based materials have shown huge potential for composites due to their excellent mechanical properties. Graphene provides transparency, high mechanical strength and good thermal and dimensional stability in order to successful incorporate it into polymers.

Read the original article on Nano Magazine.