

Activities related to research and applications in the area of graphene composites by the Graphene Flagship

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Furthermore, significant progress has been recorded in the transition of GRMs from lab-scale quantities to mass-production, e.g. masterbatches, with new production techniques.

Abstract

Composites containing graphene and related materials (GRMs) can be engineered to provide multifunctional benefits, including enhanced mechanical strength, thermal and electrical conductivity and lightness. Research in the area of graphene composites in the Graphene Flagship focuses on the development of high-performance composites for applications in large-scale industries, such as aerospace, automotive and energy generation, and consumer products. Great progress towards this end has been accomplished and is currently pursued. Numerous graphene-enhanced multifunctional components and products have been, and are currently, developed for commercial applications. Noteworthy examples of graphene composites applications include: a rudder for the Airbus A380 and an automotive oil pan, both manufactured by carbon fibre- and graphene-embedded epoxy resin for enhanced performance; a loop heat pipe with graphene coating for heat management improvement in satellite applications; flexible graphene heaters with enhanced thermal stability and lower environmental impact; a lightweight-high performance air cooling unit composed by metal foams treated with graphene; a motorcycle helmet with graphene coating for improved impact resistance and better thermal dissipation for end user comfort; graphene inks with conductive properties and tailored formulation for different printing techniques and many more.