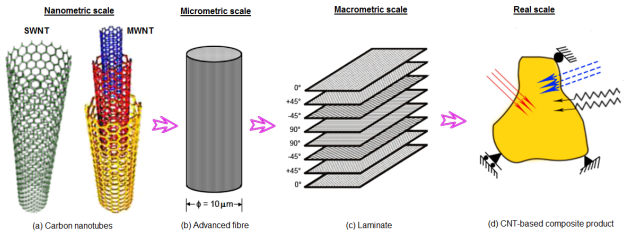
News

Eco-software improving standards related to carbon-based nanomaterials (ECOFILTER)

This research project aims to develop a specific IT tool contributing to the implementation of a strategic approach to assess and minimize the probable environmental and health risks arising from the potential use of carbon-based nanomaterials (CBNs) in many applications ranging from engineering to medicine and biology whilst maintaining the highest quality of the composite product coupled with the notion of designing environmentally friendly products.

NEW PRODUCTS AND TECHNOLOGIES



Design development from carbon nanotubes to CNT-based composite product

Future and potential products and/or composites made of carbon-based nanomaterials (CBNs), such as carbon nanotubes, fullerenes and graphene, are intended to be used for a variety of high performance applications ranging from engineering and chemistry to medicine and biology and this due to their spectacular characteristics in terms of mechanical, electrical, thermal, chemical and optical properties. However, these nanomaterials are likely to have adverse impacts on the environment and human health throughout their entire life cycle. In order to assess the probability of risks and respond positively to the available standards, among them the REACH regulation, a new KPI (key performance indicator) including environment, health and quality aspects in all design stages will be integrated in the related standards in order to help researchers gain novel insights and support new scientific developments. This will make the future innovative nanomaterials and derived products more competitive in the worldwide nanotechnology market by means of clear regulations, specific safety standards and legal predictability.

With this idea as an objective, the ECOFILTER project aims to develop specific eco-software contributing to the implementation of a strategic approach based on scientific and technological methods to assess and minimize the probable environmental and health risks that can be posed by the use of these nanomaterials. The new approach proposed is aimed to integrate in each stage of the life-cycle assessment (choice of materials, characterisation tests, theoretical formulations, finite element analysis, manufacturing processes, maintenance and repair methods, material recovery and recycling, energy consumption, etc.) an ecological factor called “eco-factor” which will take into account the environmental and health impacts in addition to quality assurance aspects.

The proposed IT tool will offer the industrial companies and interested parties the first measurement results associated to the different stages of the product life-cycle assessment; then corrective and/or preventive actions will be proposed via alternative and novel solutions (sustainable and practically feasible) leading to the addition of new elements of innovation and source of added value. With this idea as a key objective, our software could become a normative tool for qualification and certification of future eco-products made from such carbon-based nanomaterials.

Furthermore, the EU Environmental Technologies Action Plan (ETAP) for eco-technology will be our main objective to be achieved through the creation of new regulatory requirements, codes and eco-standards

promoting safe and sustainable production that will contribute to the improvement of the competitiveness of EU enterprises that are engaged in the implementation of an environmental management system marked out by a circular economy concept.

The project will be of interest to the following target groups:
- renewable energy,
- aeronautics & space,
- shipbuilding,
- automotive,
- medicine/biology,
- civil engineering (green building),
- mechanical engineering,
- chemical engineering,
- etc.

In addition, the future IT tool for standardization will play a very important role in supporting EU legislations in terms of safety and health of citizens, environment protection, workers' safety and working conditions, quality assurance system for CBN products and their sustainability.

Keywords

Carbon based nanomaterials, nanocomposites, probability approach, life cycle assessment, sustainable development, REACH regulation, ecodesign, ecofactor

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