Advanced NAno-Structured TApeS for electrotechnical high power Insulating Applications

From 2010-01-01 to 2012-12-31, closed project | ANASTASIA Website

Objective

The objective is to develop radically innovative electrical insulating tapes and process to improve the energy conversion efficiency of electrotechnical systems. It mainly addresses the electric power generation issue. Today, the energy conversion efficiency of generators is restricted by (i) thermal as well as (ii) electrical strength limitations due to the electrical insulator tapes themselves. The concepts of these multifunctional tapes are far behind the electrical insulating state of the art. The project aims to develop a new process chain leading to a drastic improvement of insulating tape structure homogeneity. The today's limitations of tape come from its heterogeneous multilayer structure bringing together very different materials like glass fibre fabric, mica flakes and polymers. Enabling this homogenisation requires higher performance materials, which will be obtained by adjunct of inorganic nanofillers according to two proposed development routes: nanodielectrics polymer or inorganic polymers (sol-gel). This will lead to a more robust process chain with a better productivity (+50%) and an insulating tape with enhanced performances like a higher field strength (+40%), a better thermal conduction (+60%). At the end, a much thinner tape (-30%) enabling the design of more compact generators is expected. This project can strongly impact the energy production field. For instance at the European scale, a +0.2% gain in generator conversion efficiency could save the equivalent of one nuclear power plant of 1000 MW (1.5 billions €), or nearly 10 fossil fuel power plants and related reduction in CO2 emission. It will also affect other very large markets like the industrial motor field using similar insulation tapes. The consortium of ANASTASIA project is equally composed of industrials and research laboratories, namely two manufacturers (tape and power generator), two generator end-users, four academic laboratories and the CEA research institute as coordinator.

Related information

Result In Brief

Nanofillers for high-voltage insulation

Report Summaries

Final Report Summary - ANASTASIA (Advanced NAno-Structured TApeS for electrotechnical high power Insulating Applications)
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Subjects
Nanotechnology and Nanosciences

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