

## **INTEGRATED STUDIES ON THE OBTAINING, BEHAVIOUR AND ENVIRONMENTAL IMPACT OF SOME CELLULOSIC COMPOSITES ON RECYCLABLE MATERIALS BASIS**

**IDEI PROGRAMME PNCDI II, Research Grant ID\_308/2009**

The main goal of the project consists in integrated fundamental and field researches to allow the use of certain recyclable materials for obtaining and exploiting cellulosic composites. In addition, the environmental impact of composites during the manufacturing process, for the period of their usage, as well as and in the post-usage phase will be evaluated.

The fundamental objective of the project is to propose a coherent conceptual framework focused on the obtaining, behaviour and environmental impact of some composites containing recycled cellulosic fibers as the main component. In this context, it will be possible to compare, assess and develop a range of indicators and technologies based on scientific concepts and methods, to form a fundamental basis for the correlation between recycling and sustainable development.

The main objectives are related to:

- performing advanced and complex research in order to get information regarding the production, behavior and environmental impact of composites containing recycled cellulosic fibers;
- obtaining scientific and technological results in the field of composites made from natural fibers, at an European level, in order to increase the visibility and international recognition of the Romanian research in this domain;
- promoting clean technologies for obtaining recycled fiber-based composites, and some methods and parameters for assessing the behavior of the composites during their exploitation;
- investigating and ranking instruments, tools, technologies and risk management or risk reduction practices in relation to environmental engineering and management, with emphasis on the manufacture, behavior and recovery of composite materials containing cellulosic fibers.
- training young researchers with internationally recognizable scientific competence in the field of composite materials made from renewable resources.

The project outcomes are intended to be: identification of sources of recyclable cellulosic fibers, as well as their characterization and ranking in order to be used for the production of composite materials; establishing appropriate methods for separation of fibers from renewable wastes with a low recycling potential and the determination of the physical-chemical properties of the recovered fibers; developing clean technologies for producing composites from recyclable fibers; investigations regarding the structure and mechanical-physical characteristics of these composites, and an analysis of properties specific to the field of usage; evaluation of the recycling technologies of composite materials containing cellulosic fibers, focused on the production of similar types of composites.

The reduction of the environmental impact in producing and using renewable composite materials will be quantified by: increasing of recovery and recycling rates of cellulosic fibers separated from recycled paper and non-woody plants; developing less polluting methods for separation of cellulosic fibers and for producing composites from recycled fibers; assessing of specific impact of composites made from recycled fibers on human health and ecosystems; studying of influence of recycling technologies and landfilling of used composites which have been removed from the economic circuit.

The research which deals with the above mentioned objectives is related to the strategic objectives of the national system of research-development-innovation, meaning that they will generate knowledge by achieving scientific and technological results which are internationally competitive.

*Project Director*

**Professor dr.eng. Dan Gavrilescu**

*Department of Natural and Synthetic Polymers  
"Gheorghe Asachi" Technical University of Iasi,  
Romania,*

[gda@ch.tuiasi.ro](mailto:gda@ch.tuiasi.ro)