

## REBIOFOAM at a Glance

REBIOFOAM is a Collaborative Project financially supported by the European Union Seventh Framework Programme (FP7) for Research. The project targets the development of a new 3D-shaped RENEwable BIO-polymer FOAMS to be applied as protective packaging material.

## Editorial

Welcome to the inaugural issue of the REBIOFOAM Newsletter. The Newsletter will have a 6-monthly issue and will be available via the project website ([www.rebiofoam.eu](http://www.rebiofoam.eu)).

## Introducing the REBIOFOAM Project

REBIOFOAM (Development of a flexible and energy-efficient pressurised microwave heating process to produce 3D-shaped RENEwable BIO-polymer FOAMS for a novel generation of



transportation packaging) is a project funded by the Seventh Framework Programme (FP7) for EU Research, which is the European Union's main instrument for funding research in Europe.

The aim of the REBIOFOAM project is to develop an environmentally-sustainable manufacturing process for the production of biodegradable foamed 3D-shaped packaging material originating from expandable starch-based polymer pellets. Expansion of the pellets is driven by pressurized microwave technology and exploits the inner water content of the material

itself to generate vapour at high pressure, which triggers the foaming process.

The project was launched on the 1<sup>st</sup> February 2009 and will be running for 48 months, until the 31<sup>st</sup> January 2013. It involves 10 Consortium partners from 8 different countries and is coordinated by the Italian company, world leader in the production of biodegradable plastics, Novamont S.p.A.

## REBIOFOAM Project's first birthday

On the 15<sup>th</sup> and 16<sup>th</sup> March 2010, REBIOFOAM partners celebrated the first birthday of the project. The Consortium gathered in Valencia, Spain, where the Spanish Packaging, Transport and Logistics

Research Institute ITENE has its headquarters, for a series of meetings aimed at taking stock of the activities carried out during the first year of the project.



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## Progress on the development of the REBIOFOAM product and process

The development of a pressurized microwave heating process for the production of 3D-shaped REnewable BIO-polymer FOAMs involves three fundamental steps: 1) development of a microwave expandable material; 2) development of a pressurized heating system, which applies microwave ports to achieve heating, must be developed; 3) development of adequate mould design for successful processing of moulded, 3D-shaped, foam products.

With respect to expanded material, important results have been achieved. Particularly, activities on mould

design have been completed, leading to the successful construction of a mould prototype to be applied for the production of a 3D-shaped foam product demonstrator.

A design for a prototype mould which includes all the features believed to be required for successful operations within the REBIOFOAM process has been completed. To accomplish this objective, dielectric properties of a range of polymeric materials and their suitability for use in microwave transparent moulds were analysed. Furthermore, work was extended to

look at the full range of properties which would be required of mould materials including operating temperature, mechanical properties and ease of mould manufacture. In addition to the choice of materials for mould construction, the additional design features a mould should have for successful processing of moulded foam products were analysed and turned into a final mould design. The proposed mould design is a 2-layer mould, which combines the beneficial properties of 2 different materials.

## First set of REBIOFOAM samples already shows promising cushioning behaviour

Protective packaging, often also identified as transport packaging, includes all packaging for the containment and protection of goods during handling, storage and transportation in the physical distribution process. The fundamental objective of transport packaging is to preserve and protect a good from damage through the manufacturing process to delivery at its final destination.

Hazards which packaged products may encounter during handling and transportation comprehend humidity,

temperature extremes, pressure changes, compression, shock and vibration. Accordingly, cushioning materials properties are determined based on the ability of the material to provide the necessary protection related to shock, vibration and other transit stresses. Other cushion characteristics include density, compressive creep, flexibility, and dimensional stability, among others.

Evaluation of the first set of available samples of the REnewable BIO-polymer FOAM shows promising and very interesting preliminary results.

Some of the new material's properties have been already evaluated. Preliminary performance tests carried out comprehended compression as well as compressive creep strain tests according to ASTM D3575-08, transmissibility tests according to BS EN ISO 13753, and dynamic shock cushioning tests according to ASTM D1596.

Biodegradability and compostability are being also evaluated. Biodegradation is currently being tested according to ISO 14851, while disintegration is being tested according to EN 14045.

### The Consortium partners



### Statement of financial support



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### Disclaimer

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