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**Research area: Product aims**

Paper, paperboard and board // Packaging papers and paperboard

**Key words:**

Packaging, paper, cardboard, green, ecological, recycled, confectionary waste, hazelnut shells, cocoa bean skins, replacement of virgin fibres

**TITLE:****ECO°PAPER: Production of paper and cardboard packaging based on the use of confectionary production waste, in partial replacement of virgin cellulose****Background/Problem area**

The increase in the cost of virgin paper, driven by a combination of market pull and the limited size of the European supply, requires technological innovative solutions that are able to reduce the dependence on standard fibre materials and provide a larger offer on the European market while limiting the use of forest resources. At the same time, it has to ensure food industry safety and quality standards. In the best case, it also reduces production costs.

**Objectives/Research results**

The project aims at the creation of a more economical and ecologically friendly packaging solution for confectionary goods. For that purpose confectionary waste, specifically hazelnut shells and cocoa bean skins, from the production of confectionary goods is pre-treated by a dry-milling process and then added to the middle layer of a triplex folding box board. There it acts as a partial replacement for standard cellulosic fibres. Hence, the waste materials are upcycled as raw materials for board production and not being treated as waste anymore which leads to a more sustainable and more economical packaging.

Industrial trials with ground hazelnut shells at the board mill in fine-tuned recipes were very successful. Thus the scale-up and technical implementation of the concept of adding ground hazelnut shells to cartonboard while safeguarding processability and product quality proved to be viable. A 10 % addition rate in the middle layer was optimum under the present conditions. The feasibility of adding ground cocoa bean skins to paperboard was confirmed on an industrial scale as well; though the cocoa bean skin addition was assessed as not sufficiently advantageous under the present conditions.

**Application/Economic benefits**

The key deliverable of the project is the definition of an efficient, sustainable and reliable industrial production process of paper and cardboard products incorporating in their recipes process waste originated from the confectionary industry. The process will be fully replicable in smaller production entities as the novel recipes require minor capital investment in technology. Industrial experience and knowhow will be the key to guarantee a rapid roll out into the European market. When the roll out is completed and by absorbing the estimated available waste materials within Europe, this will result into a market potential of 1.5 million tons of paper products made with the novel recipes.

The proposed solution finds its main targets in the food industry seeking to optimize its value chain through the use of production waste, consequently decreasing the costs related to packaging and waste management. Secondary targets are the paper mills and converters interested in diversifying their offer and thus introduce into their production systems the novel recipes by setting or adjusting their equipment to handle the different physical and mechanical properties.

**Period of time: 15.07.2012 – 14.07.2015**

**Remarks**

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