

Research Institute:

PTS München
Hess-Str. 134
80797 München

Head of the research institute:

Dr. Frank Miletzky

Project leader:

Dr. Johannes Kappen
Tel: 089 / 12146-462
Fax: 089 / 12146-36
E-Mail: johannes.kappen@ptspaper.de

Internet: www.ptspaper.de

Research area: Product aims

Paper, paperboard and board // packaging papers and paperboard

Key words:

Fractionation, Energy efficiency, Sustainability

TITLE:**Product design development of packaging paper with special consideration of selected sustainability criteria****Background/Problem area**

Within the project INFOR 143 R for the first time design principles for a resource efficient product design have been provided. Due to the complexity of the interactions between product design and recycling, as well as the very limited available experimental results a further development is required in order to derive concrete recommendations for the design of resource efficient multi-layer packaging paper.

Objectives/Research results

One focus of the experimental work is the investigation of the paper technological potential of individual paper fibre fractions and the derivation of resource-efficient design principles for packaging papers. Comparative studies at both locations PMV in Darmstadt and PTS in Heidenau showed

- that under the more realistic conditions of white water circulation and ash retention the resulting paper properties are totally different from those of fresh water circulation according to the specifications of DIN EN ISO 5269,
- that the nature and amount of inorganic constituents in the fractions influence paper properties in a significant measure

The results of the pilot-scale fractionation trials and subsequent sheet formation of various mixtures form the basis of a semi-physical simulation tool by means of which the influence of modified recipes and a change in the layer structure can be analysed for target properties.

For the above simulation tool, a calculation tool to identify various sustainability indicators was developed. Through a combination of property simulation and sustainability assessment subsequent users will be able to review the consequences of new design principles for environmental pollution and resource savings. Using these tools, and under consideration of other economic and political conditions new cascades and cycles are to be derived for the use of fibrous materials.

Application/Economic benefits

Through the targeted use of fibre fractions in individual papers layers selected paper properties of packaging papers can be significantly improved. It has been estimated that, for example, the bending stiffness may be increased by up to 10% by a simple redistribution of fibre fractions. This opens up the possibility of reducing the amount of raw materials in carton board.

The developed new approaches for cascaded use of fibrous materials help to ensure a sustainable supply of high quality waste paper with minimal environmental impact and minimal consumption of resources. Appropriate assessment and forecasting tools enable associations of the paper industry to influence their members specifically as well as the political process in order to create conditions for new resource-efficient fibre material cycles

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Remarks

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