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Research area: Process aims

Paper and paperboard production // Stock preparation

Key words:

Fibre modification, nanotechnology, fibre properties

Title:

Nanotechnological stock preparation / fibre modification for the enhancement of fibre properties/ potentials

Background/Problem area

In future, growing costs of energy and fibre raw materials will have an impact on the procurement of fibre raw materials, their preparation and the resultant production of paper and board. This also explains why the use of functionalised fibres will bring about renewed interest in papermaking. In this context, modified fibres prepared according to nanotechnological principles will become ever more important. Radical changes in the fibre and paper properties will be brought about by the use of modified fibres on a nanometre scale (< 100 nm). International findings and publications are currently concentrating on the following four main areas:

- The use of nanomaterials
- Chemical fibre modification
- Enzymatic modification
- Mechanical fibre modification.

The aims of nanotechnological modification are intended to control optic properties, the bonding power of fibres and the interaction of fibres and additives. Unfortunately, papermakers are unable or inadequately able at present to anticipate these future trends either in terms of feasibility or in terms of opportunities and risks.

Objectives

The objective of this research project is to prepare a catalogue of methods and approaches designed to prepare and make available new functionalised fibres and to evaluate them in terms of attainable effects on paper properties. The intention is to appraise future paper products, their markets and possible applications. This will help to identify and mould future key aspects of product and process development. This project is intended to provide papermakers with a position paper to facilitate decision-taking. The position paper will include an evaluation of available technologies and processes as well as on-going and completed research projects in the field of fibre modification. At the same time, opportunities and risks will be identified and scale-up possibilities will be set forth.

Application/Economic benefits

Upon completion of this project, the participating paper mills will have a sound basis on which to take decisions regarding future investments and product development. This will give them an innovative edge over their competitors.

Project period: 01.01.2007 – 31.12.2007

Remarks

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