**Title:**
Using reinforcement fibres to ensure the desired strength properties of low-grammage corrugating stock

**Background/Problem area**
The trend toward light-weight packages results in a growing demand for low-grammage corrugated base paper. A grammage reduction from 120 to 80 g/m² without changing the pulp composition and taking further technological counter-measures would decrease the bursting strength by around 30 % and the SCT value by around 40 %. This and the fact that the mineral (“ash”) content of the recovered paper grades commonly used for corrugated base paper production has been increasing in recent years contribute to strength losses in the paper structure. At the same time, higher paper machine speeds demand higher initial wet strengths of the web to withstand the higher tensile stresses. High loads of organic and inorganic fines in recycled fibre pulps limit the efficiency of strength-enhancing functional additives in the constant section of the paper machine. Strength enhancement through starch application onto the pre-dried web involves remoistening the paper – which sets another limit on paper machine productivity and speed due to more frequently occurring web breaks and the limited capacity of after drier sections.

**Research objective**
The research project aims to identify technological options to enhance the initial wet strength and ensure the desired strength and stiffness properties of corrugating stock in the grammage range of 75 to 100 g/m². This is to be achieved by adding certain shares of suitable reinforcement fibres such as unbleached kraft pulps and kraft-containing recycled fibre pulps. The strength-enhancing effect of these pulps will be investigated as a function of the material composition of different recycled fibre furnishes, of the freeness levels of reinforcement fibres and of the mixing ratios between reinforcement and recycled fibres. The experimental results will be used by the research institute to develop forecasting tools capable of calculating the effects of reinforcement fibres on the properties and variable production costs of corrugated base paper.

Another aim is the comparison between the strength-enhancing effects of reinforcement fibres and those achieved by special starch products added in the MC and HC range of stock treatment for the treatment of long-fibre fractions of typical recycled fibre pulps. This innovative way of starch application is intended to eliminate most of the factors limiting the internal starch use in the LC range (high fines content, reduced retention) in order to increase the efficiency of these functional additives based on renewable materials.

**Application/Economic benefits**
The project will produce results in the fields of raw materials, production technology and process engineering primarily for applications in the paper industry. They are intended to aid especially SME in the development of product-specific pulp formulations and in the application of efficient pulp treatment methods for the production of low-grammage corrugating stock.

**Project period:** 01.07.2006 – 30.06.2008

**Remarks**
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