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Research area: Process aims

Pulp production // Recovered paper treatment

Key words:

Recovered paper, Fibre yield, Flotation, Screening processes, Corrugating stock

Title:
New process concept including the use of flotation in the treatment of recovered paper for packaging paper production

Background/Problem area

In 2004 the German paper industry used around 5.5m tons of recovered paper for corrugating stock production. In 2005 two new corrugated base paper mills with an overall capacity of 665 kt/a went on stream in the New Laender. Their annual demand for recovered paper will amount to 720 kt/a. Recovered paper of the lowest quality grade makes up the vast majority of fibrous raw materials here because of its low cost and high availability. The high utilisation rate (108 %) of recovered paper in corrugated base paper production and increasingly closed water circuits within this product group lead to increasing shares of detrimental substances. Critical values are the shares of inorganic and potentially sticky substances. The continuing trend toward increasingly low-grammage paper products means that papermakers will in some cases be forced to achieve comparable mechanical properties by means of just 80 % of the former fibre input. This raises the question how to obtain recycled fibre pulps of a better technological use value than that achieved by current treatment methods from the low-quality recovered papers available today, and how much technical and economic outlay this will require.

Objectives/Research results

The research project aims to evaluate the technological and economic effects to be expected from the use of flotation in recovered paper treatment for packaging paper production. Preliminary laboratory tests have shown that the shares of inorganic (“ash“) and potentially sticky substances present in these pulps can be reduced by their flotation. As a result, it will be possible to better utilize their strength potential. Deciding factors for the economic efficiency of the method are the amount of solids removed by flotation as well as the achievable degree of fibre recovery from the overflow. To confine the losses to a technologically and economically defined minimum, tests will focus mainly on short-fibre fractions in the respective pulp treatment plants.

The characterisation of recycled fibre pulps has been carried out in two paper mills. A laboratory method was developed to evaluate the flotation behaviour of so-called ”brown“ recycled fibre pulps. In several trials the method has provided information about the flotation behaviour of industrially treated recycled fibres. The results show that inorganic and potentially sticky substances will be removed and the strength properties increase. Pilot flotation trials were performed using a mobile test stand, to verify the laboratory results for the flotation of recycled fibre pulps in full-scale systems. These trials confirm the results of the laboratory method. In further studies the fibre recovery from the overflow of the flotation will be investigated by means of spray and pressure filtration as well as a combination of pressure filtration and cleaners.

Application/Economic benefits

The increasing shares of contraries noticeable in recycled fibre pulps for packaging paper production in recent years are going to put a technological brake on the production of especially low-grammage corrugating stock. Besides the use of functional additives for strength enhancement, flotation is seen as a technological option to increase the strength potential of recycled fibre pulps and reduce the share of potentially sticky substances more effectively than the conventional mechanical screening methods used so far. This can be expected to result in a better end product quality and increased plant availability due to the higher cleanliness of recycled fibre pulps.

Project period: 01.04.2006 – 31.03.2008

Remarks

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