

Research Institute:

PTS Heidenau
Pirnaer Str. 37
01809 Heidenau

Head of the research institute:

Dr. Frank Miletzky

Project leader:

Constanze Seidemann
Tel: 03529 / 551-636
Fax: 03529 / 551-899
E-Mail: Constanze.Seidemann@ptspaper.de

Internet: www.ptspaper.de

Research area: Process aims

Paper and paperboard production // Stock preparation

Key words:

Paper for recycling, strength properties, stock preparation, flotation

TITLE:**Guaranteeing corrugated base paper strength by the selective flotation of inorganic constituents (de-ashing)****Background/Problem area**

The conditions under which corrugated base paper is manufactured are aggravated considerably by existing developments aimed at increasing the proportion of mineral substances in the recovered paper grades used and decreasing the grammage of the finished products. Both trends necessitate suitable additional measures to raise the initial strengths and the strength properties of the paper products.

Existing technologies can meet these requirements suitably to a limited extent only. A new approach is to improve the strength values by reducing the mineral substances contained in the pulp using the flotation process.

Objectives/Research results

The project objective was to develop a process concept in stock preparation that increases the strength of recycled fibre pulp by more than 20%. This was to be achieved by implementing a flotation stage for de-ashing the paper for recycling as well as low-intensity refining in the stock preparation process of corrugated base paper. The operation of the flotation process was to be made very selective as a result of the use of chemical additives.

This research project seeks above all to achieve the following results:

Determination of the type and amount of flotation chemicals needed to increase selectivity and the efficiency of the flotation process

Evaluation of the suitability of the flotation process to increase the strength properties in the corrugated base paper product

The following findings were obtained from laboratory- and pilot-scale trials:

Compared to initial flotation, the use of flotation agents results in an improvement in the selectivity of the discharge for mineral substances and to an increase in the material volume discharged per time unit.

Selected anionic, cationic and non-ionogenic flotation agents exhibit a comparable selective effect regarding the separation of mineral substances by flotation, i.e. the ionogenicity of the flotation agents is not critical for the amount of CaCO₃ and kaolin discharged.

Using flotation agents with the greatest selective effect, the proportion of minerals in corrugated base paper dropped from 16% to 9% with a total flotation loss of 20%. This corresponds to a relative reduction of -44%.

In addition, trials with three flotation cells that differ in volume, geometry, air supply and hydrodynamic parameters showed that these parameters do not affect the selectivity of the separation of mineral substances.

Flotation trials using a cloudy filtrate demonstrated that even low flotation stock consistency and an upstream separation of pulp cannot upregulate the selectivity of the discharge for mineral substances.

Application/Economic benefits

The project results can be allocated to the subject fields of raw materials, production and process engineering. The primary utilisation domain is the papermaking sector. Combining the selective flotation method and low-intensity refining makes both cost savings in surface thickness possible as well as the use of cost-effective fibrous raw materials. Removing minerals and other contaminants increase enhances the runnability of the paper machine which also makes an increase in productivity possible by eliminating the application of starch in the dryer section.

Period of time: 01.02.2010 – 31.07.2012

Remarks

Research project IGF 16358 BR is being funded by the Federal Ministry for Economy and Technology (BMWi)