Subject: Comparing the suitability of refining and disperging processes for optimised recovered paper treatment for the production of test liner

Background/Problem area

Recovered papers differ greatly in their compositions. The SR freeness of old corrugated containers, for example, varies between 30 and 50 °SR after disintegration. Strength values like CMT and RCT show even greater variations. The separation and separate treatment of individual suspension components is a suitable approach to influencing the quality and levelling the variations of fibrous raw materials. For many years, the fractionation-based treatment of recovered papers for corrugated board production has proved its worth as an economical solution. The high-ash short fibre and fines fractions are used for the bottom layer of the test liner largely without further treatment, whereas the long fibre fraction may be subjected to (thermo-) mechanical treatment by disperging and/or refining. The suitability of disperging processes for the reactivation of fibres containing less fines has not been investigated so far.

Objective/Research results

The project aims at enhancing the efficiency of strength reactivation processes in the recovered paper treatment for test liner production. There is a particular interest in reactivating the bonding potential of long fibres taking into account the specific filler and fines contents. To identify the technologically and economically optimum solution, refining and disperging processes must be investigated in comparison. The impact of important process and machine parameters (especially bursting strength and stiffness) on the strength properties is to be optimised taking into account the dewatering characteristics and specific energy demand for the production of packaging papers and board. From the results, conclusions will be drawn as to how to integrate these stages in the treatment processes of test liner production.

The raw materials and equipment necessary for the investigations – i.e. the recovered paper grades “mixed papers and board” and “supermarket corrugated paper and board” as well as a suitable disperger filling - were procured. To produce the desired quantity of long-fibre pulp, fractionation was accomplished by means of a pressurized screen. A slot width of 0,25 mm was found to be optimum for obtaining a high long fibre yield. In addition, a filter washer was tested and identified as a suitable fractionation device for the purpose of the research project.

Application/Economic benefits

Runnability is the critical parameter for the economic success of high-speed, large-width paper or paperboard machines. The more consistent the quality of the product, the greater the machine runnability and availability. The results of the project are expected to improve the homogeneity of the furnish, and to contribute to productivity gains in test liner production systems.

An important aim of the project is the reactivation and development of strength properties in recovered papers for test liner production by means of appropriate treatment processes and sensible combinations thereof. These should above all contribute to reductions in energy and raw material costs, and thus increased productivity and competitiveness. Further, the results may be used as a basis for decisions on plant enlargements, reconstructions or investments in the field of stock preparation for packaging papers.

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Remarks

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