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Research area/Process aims/General aims

1.5 Chemical additives/2.2 Papermaking/4 Resource saving

Key words:

Anionic trash, modified minerals

Subject:

Reduction of detrimental substances in papermaking.

Background/Problem

Typical papermaking processes are run in a neutral or faintly alkaline medium today, and involve highly closed PM circuits and growing utilisation rates of recovered papers. As a result, most mill water circuits are highly loaded with so-called anionic trash introduced with the fibres. Undesired interactions of these detrimental substances with papermaking additives can lower the efficiency of the product aids, which must be compensated for by increased additions. Deposit formation on machine parts and in the paper giving rise to process disruptions and quality complaints, soaring production costs and increased effluent loads are among the usual consequences. Apart from that, the cationic polymers currently used as fixing agents for anionic trash are extremely expensive and can be the cause of operational trouble themselves, which is why it is very difficult to actually get down to the root of the problem. The complexity of the issue requires the joint efforts of paper-makers and chemical suppliers alike. The major prerequisite for effective measures to combat these problems is the exact knowledge of the anionic trash particles present in the papermaking system, their interactions with the cationic aids used, and their depositing tendency. Based on this information, it is possible to derive optimum avoidance and control strategies.

Objective/Research results

The project is aimed at the investigation of the causes of production failures due to anionic trash and the development of effective remedies. Part one of the project focuses on the identification and characterisation of anionic trash and depositing problems currently encountered by the paper mills involved in the project, the assessments being based on offline and online measurements, using newly designed analytical methods or adapted existing ones. The results serves as a basis to develop new control mechanisms for anionic trash in papermaking systems, which are tested in laboratory and pilot scale. The most promising solutions are to be subjected to subsequent mill trials. The research project is expected to yield effective measures to combat anionic trash in order to control process disruptions, cut production costs and ensure a high and consistent quality level of the papers produced. The project has been performed according to the planned time schedule. All the work packages have been completed: Characterization of detrimental substances and whitewaters in paper mills, Development and validation of on-line measuring methods, Development of modified minerals, organic polymers and aluminium compounds in laboratory scale, Efficiency tests in laboratory scale to identify the most effective chemicals for pilot trials, Production of new chemical aids in pilot and large scale, Development of an effective computer-based diagnostics system, Trash removal trials in pilot scale with new chemicals. More than 30 new products were tested in laboratory scale with different fibre filtrates as model substances. Based on the results, the five most effective additives were selected for efficiency tests in pilot scale which were carried out on the EuroFEX pilot paper machine. In the last step of the project, the most promising new additive was tested in large scale in the two partner paper mills to assess its efficiency and the effects on paper quality and process stability in newsprint and coated paper production. The runnability of the paper machines was very good when using the new trash reducer which removed detrimental substances from the white water without negatively affecting the runnability or the paper properties. The computer based diagnostics system was implemented also in both paper mills.

Application/Economic benefits

The results of the project shall provide solutions for more effective control of detrimental substances in the papermaking process. The measures will reduce production costs and will make an important contribution to quality consistency. The project results will be disseminated to the partners of this project, to the national pulp and paper companies in the countries of the participating organisations and to allied branches in Europe. The project results will be summarized in the final project report, published in the technical press and disseminated within the framework of the continuing education programmes of the participating institutions. The chemical suppliers will offer their newly developed and improved products in the marketplace. The institutes will disseminate the project results in articles in the technical press and in presentations at symposia, workshops and other events of their continuing education programmes. These affairs are primarily attended by representatives of the European paper and chemical industries.

Project period: 01.09.2001 – 28.02.2005

Remarks

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Are you interested? Then send us this short description with your name and address via fax. The project manager will contact you afterwards.

I want more information

I want to participate in the project

Company:

Adress:

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