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**Research area: Product aims**

Raw materials // Paper of Recycling

**Key words:**

Paper for recycling, modelling, dry sorting concepts

**TITLE:****Developing tools to design plant concepts for the dry sorting of papers for recycling with new product aims****Background/Problem area**

European demand and manufacturing structures for graphic and packaging papers have changed significantly in recent years. Graphic papers have been suffering a steady decline in both consumption and production volumes, whereas packaging papers and boards have remained at a consistently high level. Against this background, the consumption and key quality requirements of papers for recycling can be expected to shift from graphic mass papers to packaging production in future. However, the packaging sector's growing demand for high-quality paper for recycling is opposed by qualitative changes in paper products such as increasing shares of material composites, highly ash-containing papers etc. as well as by the fact that the technologies and operating regimes of sorting plants have been designed exclusively for the quality demands of the fractions used in graphic paper production (grade 1.11). These trends and the growing need for plant concepts that enable the economical operation of dry sorting systems have given rise to a research project aimed at studying the production of raw materials for packaging mills by dry sorting papers for recycling from household collections.

**Objectives/Research results**

Aim of the research project is the development of tools that can be used to derive new sorting concepts for household collections mainly in order to obtain papers for recycling for packaging paper and board production.

The new sorting concepts are intended to offer to packaging paper manufacturers a possibility to reduce process and quality problems that result from the growing shares of non-paper materials, ash and short fibres in the paper for recycling.

The project work involves a detailed stocktaking of the separating characteristics and utility values of the paper products that occur in relevant amounts in PfR from household collections as well as the sorting methods including their separation behaviour that exist both currently and in the near future. Another focus of the work is the preparation and development of a software-assisted tool for selectively choosing sorting procedures (selection tool) and for the utility value-oriented and economic evaluation of sorting concepts (simulation tool).

It was elaborated that the focus in sorting packaging paper for recycling lies in sorting the paper products according to the pulp composition – besides separating the non-paper materials – such as:

- separating highly ash-containing paper products to enhance the pulp characteristics that impart volume and strength, or
- separating kraft-containing packaging to obtain secondary fibre pulp with great strength potential.

Based on economic feasibility studies, it was able to be demonstrated that an essential prerequisite for an economically viable sorting concept lies in tapping the maximum synergy potential between dry PfR sorting and PfR treatment in a paper mill and in the efficient separation and profitable utilisation of the contaminants that can be separated out by dry sorting processes. The design and economic evaluation of the process for producing and using the new packaging paper for recycling quality take place under the framework conditions of a reference region. This provides the waste management industry and the paper industry with practical decision-making tools for implementing such a concept.

**Application/Economic benefits**

The systematic sorting of papers for recycling to obtain qualities suitable for packaging paper production is a new technological and economic concept for dry sorting plants. It enables packaging paper producers to reduce quality problems caused by growing shares of surface-finished packages in paper for recycling as well as by the further closure of packaging cycles. Basically, the new process concepts are intended to provide the following technological and economic benefits to operators of automated sorting plants as well as producers of packaging paper and board:

- Reliable processing and lower treatment cost of pulps for packaging paper and board production due to lower shares of non-paper components in grades 1.02 and 1.04 (obtained by dry sorting)
- Long-term profitability of sorting plants by winning packaging production as principal market for superior grades of papers for recycling

**Period of time: 01.01.2014 – 31.12.2015**

**Remarks**

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