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**Research area: Product aims**

Paper, paperboard and board // graphic papers

**Key words:**

Deinkability, inkjet printing, paper surface

**TITLE:****Recyclable product design of water-based inkjet printing products****Background/Problem area**

Significant advances in inkjet print head technology enable to produce highly reliable and productive inkjet printing systems for digital full-colour production printing. Therefore, generally sustained growth is expected in this area.

Current water-based inks create problems in recovered paper treatment for graphic paper production as they cannot be removed in this process and require additional process steps.

The predicted increase in the proportion of inkjet printing requires developing or adapting products, which allow the recycling of recovered paper with changing composition.

**Objectives/Research results**

The aim of the project is to develop inkjet printing products with selected recipes / processes that ensure recyclability as far as possible. This is intended by modification of the paper surface.

Based on laboratory tests papers were produced at the high-speed pilot coater of PTS and were printed in offset and inkjet printing. The coated paper samples are printable in offset and inkjet printing. Deinkability tests according to INGEDE Method 11 showed that good deinkable inkjet prints can be obtained by varying the coating pigments. Pigments with high surface area can improve the deinkability. Samples with 10 pph of calcium silicate hydrate showed the best results. Regarding the deinkability a calendering has a positive effect. Improved print results are in parallel to improved deinkability.

Experiments showed the possibility of agglomerating aqueous, pigment based inkjet inks including inks of different colours by means of the addition of cationically charged polyelectrolytes.

The experimental approach showed basic correlations between zeta-potential, particle size, the type of pigment based ink and type of polycation, which can be used to identify the parameters leading to better flotation deinking results with the inkjet inks used.

Tests showed that multivalent salts and polycationic substances can agglomerate pigment based inkjet inks. Surface treatment reduce attachment of inkjet inks on fibers.

**Application/Economic benefits**

Printers can offer a deinkable and thus environmentally friendly inkjet print product. The improvement in the deinking of recovered paper critical to deink allows paper mills to improve the quality of the finished stock.

For companies in the value chain, benefits of the project results are the recycling-friendly design of printed products to protect the market from print media and the medium to long-term security of recovered paper utilisation in the production of graphic papers, with all its ecological and economic advantages.

**Period of time: e.g. 01.07.2012 – 31.06.2014**

**Remarks**

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