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Research area: Product aims

Paper, paperboard and board // Graphic papers

Key words:

Inkjet printing

TITLE:**Developing a method to assess the printability of papers in water-based inkjet printing****Background/Problem area**

The widespread use of trial-and-error methods to design coated and uncoated surfaces or select suitable substrates leads to high costs and prolonged developments. The printability of substrates can only be assessed with absolute certainty by costly and time-consuming test prints made on pilot or even industrial presses. In spite of the steadily growing importance of inkjet printing, there are still no technically mature measurement techniques to assess the penetration behaviour. Indirect methods are inaccurate and can only provide averages of more or less extensive areas. Near-practical counter prints and single-drop analyses by means of a high-speed camera are the most sophisticated and informative methods available today. A fast, inexpensive and easy-to-use forecasting method to assess the principal suitability and resulting print quality of substrates in inkjet printing is still lacking.

Near-practical counter prints provide qualitative information about specific printing issues (e.g. Datamatrix codes on cartonboard), but their results could not be generalized so far. Penetration measurements by means of a high-speed camera characterize the penetration behaviour with adequate reliability because they determine the penetration speed of single drops. However, it is still difficult to draw conclusions about the print quality actually achievable because the latter also depends on the distribution and fixation of printing inks in the coat layer or paper structure. This deficit may be overcome when the method is developed further to analyse the penetration of multiple ink drops and drop sequences. Combined with powerful existing measurements, the new method could make it possible to reliably assess the suitability of papers for inkjet printing.

Objectives/Research results

Aim of the project is to develop a fast, reliable and objective method to evaluate the suitability of papers for inkjet printing. An evaluation method that considers the results of specific measurements (high-speed camera, Datamatrix tester), test prints and, if possible, model calculations will enable fast paper classifications in terms of inkjet printability. A camera test bench will be developed further to use its results for the improvement and optimisation of existing base models for penetration characteristics. The project contributes to a strategic goal of long-term PTS research: developing modular simulation tools to improve the printability of paper. The modelling methods and tools required for this will be developed step by step in the form of modules. They must be complemented by measurement techniques capable of providing the data and data quality needed for modelling. The measurement technology developed in research project IK-VF 100010 and penetration models obtained in various earlier projects will be improved here.

Application/Economic benefits

The results will be of interest to the entire value chain of the packages and coated graphic papers investigated in the project, including:

- paper and board producers (cartonboard; corrugating stock; coated graphic papers)
- converters (printers)
- machine builders (printing press manufacturers)

The results are expected to bring the following main technical and economic benefits:

- reduced development effort of paper producers (more efficient laboratory tests and pilot trials)
- fewer costly and time-consuming pilot-and full-scale printing trials
- faster and target-oriented improvement of printability characteristics through systematic raw material selection and optimisation
- cost and time savings for printers due to the use of substrates with optimised printability characteristics (fewer misprints)
- cost and time savings for printers due to higher flexibility in connection with hybrid printing papers.

Project period: 01.09.2013 – 31.08.2015

Remarks

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