

**Research institute:**

PTS Heidenau  
Pirnaer Str. 37  
01809 Heidenau

**Head of the research institute:**

Dr. Frank Miletzky

**Project leader:**

Dr. Gert Keller  
Tel: 03529 / 551-623  
Fax: 03529 / 551-889  
E-Mail: gert.keller@ptspaper.de

Internet: [www.ptspaper.de](http://www.ptspaper.de)

**Research area: Product aims**

Paper, paperboard and board // Packaging papers and paperboard

**Key words:**

Flexo printing, inkjet printing, penetration, printing inks

**TITLE:****Improvement of inkjet printing on packaging papers by detailed analysis of penetration processes during printing****Background/Problem area**

At present, packages are mainly printed by offset (folding box board) or flexographic methods (corrugated board). Current market demands show an explicit need for smaller production runs, personalised printing and special labelling (e.g. matrix codes) of packages. For those demands digital printing techniques are highly suitable. Unfortunately currently used printing substrates lead to insufficient quality when printed by low-cost inkjet methods. Since inkjet printing (digital printing) will gain importance besides the currently predominant offset and flexographic methods, an important aim was to modify the surface of packages in such a way that good print quality can be achieved by inkjet printing as well as by the other printing techniques.

**Objectives/Research results**

Therefore, the project aim was a detailed analysis of penetration processes occurring during the printing of packaging papers. Important requirements on the optimal printing of folding box board and corrugated board materials by inkjet pigment inks were to be identified.

The project was subdivided into 3 parts:

- In the first part, currently available packaging papers and their surfaces were to be characterised, focusing on parameters that are important for printability based on the present knowledge. Especially commonly used coatings were to be analysed concerning their porosity and surface characteristics with regard to printing inks.
- In a second part, penetration processes were to be characterised by several, partly new methods. In industrial offset, flexo and inkjet printing, these penetration processes take place within five seconds and thus still in the printing press. New reverse printing measuring devices for flexographic methods as well as fast camera measurements were developed to visualise the penetration processes of printing liquids into paper layers (coatings and base papers).
- Finally models were generated with the help of extensive measuring data to describe and evaluate the penetration processes and their most important parameters, covering both short-term capillary driven penetration processes and subsequent diffusion steps.

Together with the measuring results the models make it possible to characterize fundamental properties of printing substrates and to derive information on and requirements for better inkjet printability of packaging papers.

**Application/Economic benefits**

As a result of this research project specifications were formulated for improved package surfaces enabling considerably better inkjet printing. These changes should lead to higher quality in package printing as well as to more versatile applications of inkjet printing on packages, particularly for smaller print runs and personalised packaging.

The results will help smaller print companies to handle such print runs more effectively.

The project results can be expected to benefit mainly small and medium sized enterprises in the printing and packaging industries.

**Period of time: 01.07.2012 – 30.06.2014**

**Remarks**

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