

Research Institute:

PTS Heidenau
Pirnaer Str. 37
01809 Heidenau

Head of the research institute:

Prof. Dr. Frank Miletzky

Project leader:

Katrin Kühnöl
Tel: 03529 / 551-611
Fax: 03529 / 551-899
E-Mail: katrin.kuehnoel@ptspaper.de

Internet: www.ptspaper.de

Research area: Product aims

End products made of paper, paperboard
and board // Print products

Key words:

Abrasion test, method development, abrasion testers, reproducibility, comparability, influences

TITLE:**Phenomena of printing ink cohesion and standardised evaluation options****Background/Problem area**

Abrasion wear is very disturbing and constitutes a serious quality defect especially in high-grade print products. Printers must often use material combinations for which no information is available, which increases the risk of abrasion defects in subsequent converting steps or during use of their print products. This problem could be overcome by a deeper understanding of the various material influences on print product abrasion and the future availability of more detailed information on the material parameters relevant to abrasion.

Objectives/Research results

New models describing the causes of reduced abrasion resistance in sheet offset print products will be tested and verified. The reproducibility and inter-laboratory comparability of the established abrasion test method will be investigated in detail and improved if necessary. Another aim is to create the basis for extending the scope of the ISO standard "Determination of abrasion resistance of photographic images" to industrial print production.

Sheet-fed offset prints using six different inks were produced on sample papers. Both unprinted papers and the printed and unprinted areas of prints were examined in terms of surface tackiness, surface topography, pore volume and surface elasticity to document the changes caused by printing.

The market offers many different abrasion testers and procedures which differ considerably in instrument design, loading mechanisms, force application and the aids or tools used. Abrasion tests were performed on the test prints by means of selected instruments to investigate the influence of different test conditions. The abrasion resistance was assessed visually, and then by image analysis after scanning the samples.

Application/Economic benefits

The project is intended to create the basis for a multi-parameter analysis of the material influences on abrasion test results. This will help to reliably avoid abrasion defects in industrial print production, and - by enabling printers to obtain information about a practically manageable number of paper and printing ink parameters from the corresponding manufacturers - make printing jobs significantly more stable and reliable in future.

The envisaged improvements in the ISO test method will make its test results more comparable; and the inclusion of abrasion testers commonly used in Europe in ISO 18947 will make it easier to communicate its results on a worldwide scale.

Project period: 01 June 2014 – 30 November 2016**Remarks**

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