Title: Development of methods for reducing the marking tendency of matt and semi matt coated papers

Background/Problem area

Processes like printing and converting can cause glossy areas on the surface of matt and semi matt coated papers. These glossy areas impair the optical quality of the final paper product. Markings develop due to process-related causes wherever the paper surfaces are highly subjected to mechanical loads. This occurs especially in format finishing, e.g. converting in cross cutters, decollating, transportation or stacking of sheets or the make-up of packing units in the print shops. The more or less abrasive surface contact (static and dynamic friction) between papers or between paper and machine or transport elements (e.g. rubber belts) is responsible for the formation and characteristics of the surface markings.

Objectives/Research results

The objective of the project is to reduce the marking tendency of matt and semi matt coated papers. One prerequisite is to identify the decisive loads responsible for the markings during converting. The second prerequisite is to acquire knowledge about the relevant base paper and coating characteristics that lead to the surface defects. An identification of these causes under practice-oriented conditions is only possible with the help of convenient test methods which have been newly developed in some cases. A test method for the application of frictional forces combined with an image analytical tool for evaluating gloss changes on the surface has already been developed during the project. Measurements with this device led to initial findings of impact factors. Beside the pigments, the binder also has a substantial impact on the marking tendency. Papers containing hard binders seem to be less vulnerable than papers with soft binders. During the production and converting of matt and semi matt papers, the cross cutter is the most critical part of the process chain. Most complaints about quality defects caused by gloss markings can be identified as pressure-shear loads on the cross cutter. Typical gloss markings of cross cutters and winders have been identified and correlated to the sections or parts of the converting machines.

Application/Economic benefits

The results of the research project will help to ensure a constant quality standard and product optimisation in particular in small and medium-sized enterprises. This in turn will improve the competitive edge of these enterprises. Exploitation of the results will help especially the producers of matt and semi matt coated speciality paper for top-quality products. In most cases, these manufacturers have small production units with high flexibility. The availability of quality control instruments and knowledge about how to prevent quality losses are important factors for SMEs to access a delicate, but interesting and seminal market. The results of the research project will bring about modified test methods. These methods will open up new markets for the medium-sized enterprises that can provide the appropriate measurement technique.

Project period: 01.05.2006 – 30.04.2008

Remarks

The research project IGF 14759 is being funded by the German Federal Ministry of Economics and Technology BMWi and performed together with Dresden University of Technology.