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Research area: General aims

Production economy // Monitoring and control systems

Key words:

NIR-spectroscopy, paper strength parameters

Title:**Fast control of strength parameters and other properties of printing paper****Background/Problem**

The measurements and the control of paper properties are often costly and time consuming, for example because of the necessary climatic conditioning of the papers. Therefore, most of the smaller printing companies can't afford to do a complete quality control of their incoming raw printing papers. They have to rely only on the paper specifications given by the paper manufacturers.

The quality control of the papers should include a classification in quality categories and also the determination of the chemical and physical properties of the papers such as pulp composition, surface and strength parameters.

Near infrared (NIR) spectroscopy offers the possibility of at- or online monitoring of paper properties. By special probes the NIR spectra can be taken directly on the surface of the paper. The data from the spectra are then correlated to the paper properties using chemometric calibration methods.

Research objective/Research results

The aim of this project is the development of a fast and reliable near infrared (NIR) spectroscopic method for the quality control of printing papers. PTS has already established a NIR measuring method (PSS – Paper Spec Sensor) for the determination of quality properties of corrugated papers. In the project this system, hardware and software, will be adapted to determine the specific quality parameters of printing paper. The measurements should and can be directly done on the paper reels or the raw paper sheets without any loss of material.

According to the time schedule the hardware has been set up properly, the nir measurements to calibrate the system have been made and several qualitative and quantitative methods have been developed. These methods can calculate chemical and physical parameters, but the focus is on the side of the chemical ones and those strongly related to chemical composition.

Other developments have been taken place in the software of the final measurement system. Using software creating tools a program has been built to guide the user through the measuring course. Beginning with the designation of the paper sample, the important steps of reference measurement and the further steps of the sample measurements can be triggered by pushing a button. Background activities will be executed by the software. The results will then be shown on the screen with additional information (e.g. precision). The results are saved automatically together with the sample name and date and time of the measurement.

Application/Economic benefits

Like the already existing PSS system the new NIR method for the printing papers will determine qualitative and quantitative parameters. The quality monitoring can be done just after the production at the paper manufacturer to control conformity specifications. But, it is also possible to do the analysis on the printing paper stock at the printing company. This quality monitoring just after or during the production process makes it possible to react in a short delay to changing process parameters and to avoid waste production.

Project period: 01.02.2005 – 31.12.2006

Remarks

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