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Research area: General aims
Production economy // Monitoring and control systems

Key words:
Online monitoring, coating papers

Title:

Development of a spectroanalytical online technique using spatially arranged probes for the simultaneous measurement of felt and wire sides of high-speed LWC paper webs

Background/Problem

To accommodate the further growth in coated grades, paper producers must increase their production speeds and capacity whilst modernizing their quality control systems. Since new paper machine installations will continue to be an exception also in the years to come, existing systems must be adapted to the increased requirements. The industry needs innovative, comprehensive process solutions involving minimum risks to further raise its production output without losses in product quality.

Around 30% of the papers currently produced in Germany are coated grades. Their market shares are expected to grow by another 6% in the next few years, spurred by continuously high or increasing quality demands and the trend toward using more cost-effective fibrous raw materials. Papers produced from cheaper fibres must be coated with pigment-containing suspensions to ensure their printability.

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

Research objective/Research results

The research results are

- Development of a sensor for the independent measurement of felt and wire sides of the paper web during production.
- During paper production it is possible to measure the white standard automatically. The white standard is placed into the sensors.
- Development of a software for the online measurement of NIR spectra including their processing and analysis on a mathematical and graphical platform for both sides of coated paper.
- Development of calibration methods for the determination of SB binders and whole binders at an accuracy of ± 0,25 g/m² or ±0,23 g/m².
- The calibration methods were tested and adapted in the pilot plant of PTS.
- The aim of the project was reached.

The results were obtained in co-operation with the company LLA Instruments GmbH.

Application/Economic benefits

The research results are of interest to manufacturers of coated papers. The online monitoring of production processes is becoming more and more important. Growing economic and legislative demands on product quality make it necessary to control the product parameters at any stage of the production. The proposed method makes it possible to monitor important properties of coated papers in real time. This improves the quality management and helps to avoid costly off-spec production.

Project period: 01.01.2005 – 31.12.2006

Remarks

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