

Research institutes:

PTS Heidenau
Pirnaerstr. 37
01809 Heidenau

Head of the research institute:

Dr. P.W. Rizzi
Project leader:
Dipl.-Ing. P. Behnsen

Tel: 03529 / 55 16 85
Fax: 03529 / 55 18 99
E-mail: P.Behnsen@ptspaper.de

Internet: www.ptspaper.de

Research area: General aims

Production economy // Monitoring and control systems

Key words:

Online monitoring, paper strength parameters

Title:

Development of a measuring procedure for the online evaluation of quality determining strength parameters of raw papers for corrugated container boards

Background/Problem

Nowadays the testing of raw papers for corrugated container boards is exclusively carried out by laboratory testing methods. These methods are often complicated and time consuming. A first evaluation of the strength potential of the pulp used for the paper production is done after the stock preparation by testing a handsheet made from the stock. But the testing of the real product is only carried out after taking a sample from the final full paper reel. Until now, a process control of the paper strength parameters in real time is not possible.

Near infrared (NIR) spectroscopy offers the possibility of online monitoring of paper properties. By special probes the 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

1. Development of a sensor for the independent measurement of the top side and lower surface of the paper web during the production.
2. Development of a multiplex sensor which is able to measure at the same time at several points along the CD-profile.
3. Development of calibration methods for the determination of the strength parameters SCT and the determination of the ash content.
4. The calibration methods were tested and adapted on the paper pilot plant on PTS.
5. The accuracy of the tested methods are for the parameter SCT $\pm 0,2$ kN/m and for the ash content $\pm 0,6\%$.
6. Development of a software for the online measurement of the NIR spectra and to treat and analyse them on a mathematical and graphical platform.

Application/Economic benefits

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

Project period: 01.02.2005 – 31.12.2006

Remarks

This project INNO-WATT 050277 performed under the INNO-WATT programme is being funded by the Federal Ministry of Economics and Technology.