WAGENINGEN UR
For quality of life

Wageningen Paper and Board

Newsletter for the paper and board industry and its suppliers
October 2006, number 7

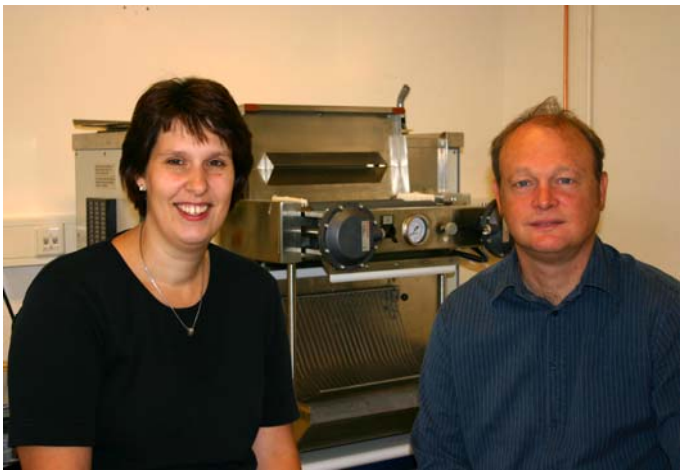
Coating research at Wageningen UR

Surface sizing and coating techniques to enhance paper properties

Due to increasing demands on paper performance, research at Wageningen UR Paper and Board is focused on coating developments that improve paper properties on several fields. Also the need for energy reduction stimulates the search for new sizing techniques and finding alternatives for starch.

For several paper and board related end-products, surface properties of the base material can be improved by applying a coating layer. The coating can give specific properties to paper such as gloss or printability, or can protect against external influences like high relative humidity. In this case it is important that a smooth and closed layer with the required properties is formed. For the reduction of water penetration the coating layer must possess a highly hydrophobic character. Coatings based on waxes or oil based products can be used for this purpose.

In contrast to coating techniques where a distinctive layer is applied, surface sizing of paper can be carried out by using a sizepress. In a sizepress, the adhesive is forced into the paper and penetrates deeply in the sheet structure. Intensive interactions and hydrogen bonds between the paper fibers and adhesive material are accomplished. As a result, the mechanical properties of recycled paper are improved considerably.
Last decades, the speed of paper machines has drastically been increased. Therefore, optimization processes of the adhesive formulation have been performed. Speed limitations of the sizepress are for example related to the rheological behaviour of the adhesive. In collaboration with the paper and board industry, research is carried out on improving the use of the size press. Finding the optimal dry matter content in relation to viscosity and molecular weight of starch glues is an important issue. In this aspect, optimization of the size press also contributes to the search for energy reduction in papermaking by decreasing the amount of drying energy.



Wim Mulder, theme leader of Papercoatings at Wageningen UR: "The search for technologies that make it possible to increase the dry matter content of starch-based dispersions is an important issue. Approximately 50% of the total energy supply in paper production is used for the removal of water from the product. You can imagine the energy savings you can obtain just by increasing the dry matter content of dispersions."

Laboratory technician Nicole Engelen and theme leader Papercoatings Wim Mulder

Besides starch-related research, projects are performed to find alternative sizing- or coating materials that reduce costs or result in better paper properties.

More information: Wim Mulder (wim.mulder@wur.nl)

News

CEPI-CTS

Within the CEPI (Confederation of European Paper Industries), an international working group termed the CEPI Comparative Testing Service (CEPI-CTS) organises laboratory tests for physical material testing of pulp, paper, paperboard and corrugated board.
As from January 2007, Wageningen UR Paper and Board will take over all the CEPI-CTS activities from TNO. This transfer is the result of a reorganization at TNO and is approved by the CEPI.

With the participation of Wageningen UR Paper and Board in CEPI-CTS, a continuation of all activities can be guarantied. TNO and Wageningen UR will organize a complete transfer within the next two months.

Richard Op den Kamp will become CEPI-contact person at Wageningen UR Paper and Board and can provide your company with information on how to participate in the Comparative Testing Service of the CEPI.

More information:
Richard Op den Kamp
(richard.opdenkamp@wur.nl)

Annita Westenbroek leaves Wageningen UR Paper and Board

After 11 years of being employed at Wageningen UR, Annita Westenbroek has left Wageningen UR Paper and Board. She continues to work for the paper and board industry at the Centre of Competence Paper and Board in Arnhem.
At Wageningen UR, Gulden Yilmaz has become responsible for customer contacts and the coordination of new project proposals.

More information: Gulden Yilmaz
(gulden.yilmaz@wur.nl)

Progress in 'SustainPack'

Research focused on demonstrators

SustainPack, a research project sponsored by the European Commission, is now half-way its 4-years term. The project aims at material reduction and enlarged application of fibre-based products in packaging. In order to match technological research with developments and future trends in the packaging market, 7 integrated demonstrator projects have been identified. Within these demonstrators, a number of research topics within SustainPack are combined:

- A corrugated box offering equivalent performance with lightweight material, barrier coatings and RH-indicator (1)
- A carton offering equivalent performance with lightweight material
    - incorporating barrier coatings and 2D-barcode (2)
    - incorporating a laminated barrier film and 2D barcode (3)
- A barrier coated tray for chilled ready meals, sealed with a biobased nanocomposite film lid and incorporating a temperature logger (4)
- A flexible packaging film for
    - frozen food, incorporating barrier coatings and temperature logger (5)
    - snack products, incorporating barrier coatings and RH-indicator (6)
- A carton board or micro-flute box for luxury goods incorporating a biodegradable polymer window, moving image and anti-counterfeiting technology (7)

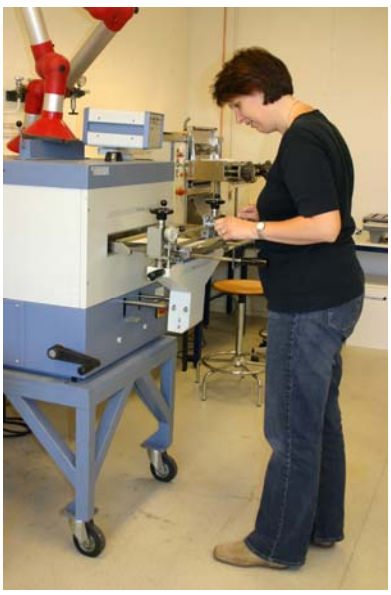
Each project combines a number of research topics within SustainPack. It is intended to produce and test the 7 types of packages and create maximum interest to the general public and industrial partners.

More information: Ingrid Wienk (Ingrid.wienk@wur.nl)

Facilities

Coating lab

Recently, a new coating lab has been setup, concentrating all coating-related equipment of Wageningen UR Paper and Board. On this lab a variety of coating equipment is available:



Nicole Engelen working on the labcoater of Mathis

- Sizepress (SP, Mathis) for paper impregnation. The rollers (350 mm width) can be heated up to 70 °C, thereby simulating conditions used in practise. The sizepress can also be used for dyeing, finishing, as well as application of optical whitener.
- Labcoater (LTE-S, Mathis) for coating of paper by means of a doctor knife. The coater has a build-in dryer.
- Control coater (K 202, RK Print Coat Instruments) with an aluminium surface that can be heated upto 200 °C. The coating is being applied by means of a wire bar.
- K-Lox Proofer (RK Print Coat Instruments) for application of flexo ink or other liquid coatings.

Drying of the applied coatings is possible on a speed dryer (Labtech), IR-dryer, or in conventional ovens. It is possible to determine coating formulation properties (e.g. viscosity, curing temperature) and to analyse the paper coating properties such as surface tension, colour, gloss, or adhesion.

More information: Wim Mulder (wim.mulder@wur.nl) or www.papierenkarton.nl/facilities.htm

Events

Presentations

Towards mill trials with dewatering-improving enzymes, H. van der Valk, 7th International Wet End Chemistry Conference PIRA, Madrid, Spain, 26-27 September 2006.

Using enzymes to improve dewatering, H. van der Valk, 2nd Workshop ECOTARGET, München, Germany, 11 October 2006.

IEA Bioenergy
Task 42: Biorefineries

Within the International Energy Agency (IEA) Bioenergy framework, a new task 42 on Biorefineries has been approved. This task will initially run from January 2007 till December 2009.
The Biorefineries Task covers a new and very broad biomass-related field with a very large application potential. To open up the biorefinery-related potential, international system and technology development together with industry is a necessity. Special emphasis will be put on forest-based biorefineries.

More information:
Ed de Jong (task leader, ed.dejong@wur.nl)
René van Ree (vanree@ecn.nl).

Wageningen UR Paper and Board

Major Research Themes

Fibre Raw Materials
Fibre quality and choice related to processing and end product requirements
Fibre Processing
Reduced energy consumption during fibre processing and in the total paper production line
Papermaking Chemistry
Synthesis of new or more effective chemicals based on natural raw materials
End Product Quality
Insight in product requirements based on converting and consumer demands, enhancing end product performance and development of packaging
By-stream Upgrading / Processing
Creating commercial value for solid by-streams from pulp and paper production processes

Colophon
Wageningen Paper and Board is meant to inform all contacts of WUR Paper and Board about research activities, new developments and projects. The newsletter will be issued 2 times a year and is also available on the website, www.paperandboard.nl.
Editor: P.F.H. Harmsen, tel. +31 317 475328, P.O.Box 17, 6700AA Wageningen, paulien.harmsen@wur.nl

WAGENINGEN UR
For quality of life