



## **STFI-Packforsk – a meeting-point for industrial research**

**New cluster research programme  
soon ready, page 4**

# Visual Interfaces – new field of expertise at STFI-Packforsk

A co-operative agreement has just been signed between STFI-Packforsk and Acreo AB, a research company in optics and electronics. This collaboration includes the following areas: Visual Interfaces, Sensors, Organic Electronic/Intelligent Packaging as well as SME (Contacts with Small and Medium sized Enterprises). The aim is to establish joint projects in these areas.

Visual Interface research and devel-



The agreement was signed by the two research companies on 20 January, 2005.

opment will be carried out in the Paper as an Information Medium Division at STFI-Packforsk. Three researchers from Acreo now belong to the division.

Marie-Claude Béland defended her doctoral thesis in optics some years ago and has been the manager of the Visual Interfaces Group at Acreo in Kista for the last few years. As a research scientist, she worked at Paprican in Canada. Marie-Claude's previous research experience will benefit the Company. She took over as Research Manager for the Appearance & Imaging Group at STFI-Packforsk on 1 February.

Ludovic Coppel is the Manager of the POP Project (Paper Optics & Perception). Ludovic specialises in modelling and simulating light scattering in complex structures. These models are used for paper optics.

Hjalmar Granberg defended his doctoral thesis in optics in November, 2003. Hjalmar is based at Acreo in Norrköping. There, he is the STFI-Packforsk



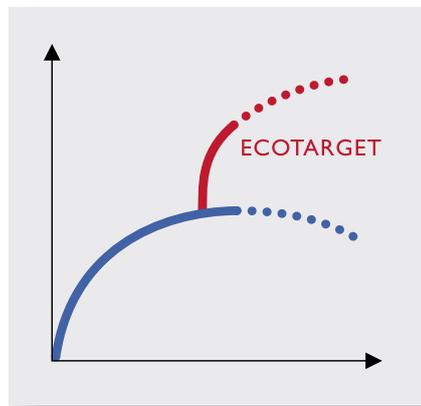
**Ett samarbetsavtal** har nyligen skrivits mellan STFI-Packforsk och forskningsbolaget Acreo AB för områdena Visuella gränssnitt, Sensorer, Organisk elektronik/Intelligenta förpackningar samt kontakter med små och medelstora företag. Arbetet med visuella gränssnitt ska utföras inom STFI-Packforsks division Papper som Informationsmedium. Tre personer från Acreo knyts till divisionen: Marie-Claude Béland, som gruppchef, Ludovic Coppel och Hjalmar Granberg.

link for, among other things, work on paper electronics and organic electronics that will be carried out in collaboration with Acreo and Linköping University.

"We are already witnessing positive synergy effects in perception, image analysis and optics, with more to come," says Pia Wågberg, Division Manager.

"The newly started collaboration means that we are on the way to consolidating know-how in Appearance and Imaging. A concentration of resources facilitates building advanced knowledge and technological platforms," comments Thomas Johannesson, President of STFI-Packforsk. ●

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## More from less

Increased production with the same amount of resources, or with even less, must be the target for many producers. To achieve this, radical changes are often needed.

A new integrated project in the EU Sixth Framework Programme aims at supporting the European pulp and paper industry with new and innovative processes, from the production of pulp to the paper product. The most radical ideas for new processes have been brought together in ECOTARGET. The common thread binding all these process ideas has been described as "More from Less".

"This means producing more functionality using less resources," says the Project Co-ordinator, Catharina Ottestam. "All the ideas in the project are aimed at reducing consumption in at least one of the four target areas, viz. Raw Wood Materials, Energy, Water and Waste & Emissions. Each idea has the potential of producing a 20–30% reduction in one or several of these target areas.

ECOTARGET, which is co-ordinated by STFI-Packforsk, is the largest research project ever in the European pulp and paper industry. It is financed by the European Commission. No less than 26 partners from 9 countries all over Europe are participating in this project, which is directed at new and innovative processes for making radical changes in the European pulp and paper industry. The partnership covers universities and institutes as well as supplier companies and paper makers.

The project kick-off took place at STFI-Packforsk on 14–15 December, 2004, with more than 60 participants attending. Besides the presentation of each sub-project, the new web site for [www.ecotarget.com](http://www.ecotarget.com) was unveiled and put on-line. This site provides more information about the project and its progress. ●

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## PROJECT STRUCTURE

The project is divided into five technical sub-projects (SP) plus a sub-project in which the aims are to be evaluated.

- SP1: Virgin fibre supply
- SP2: Recycled fibre supply
- SP3: Furnish solutions
- SP4: Papermaking solutions
- SP5: Process water
- SP6: Integration



**ECOTARGET** är ett europeiskt forskningsprojekt som ska utveckla nya och innovativa processer för att åstadkomma radikala förändringar inom massa- och papperstillverkning. Den röda tråden för alla nya processidéer sammanfattas i "Mer av mindre".

– Detta innebär att producera mer funktionalitet av mindre råvara, säger Catharina Ottestam, projektkoordinatör. Alla idéer syftar till att minska förbrukningen med 20–30% inom de fyra områdena vedråvaror, energi, vatten och utsläpp.

Projektet, som koordineras av STFI-Packforsk, är det största projektet någonsin inom den europeiska massa- och pappersindustrin.

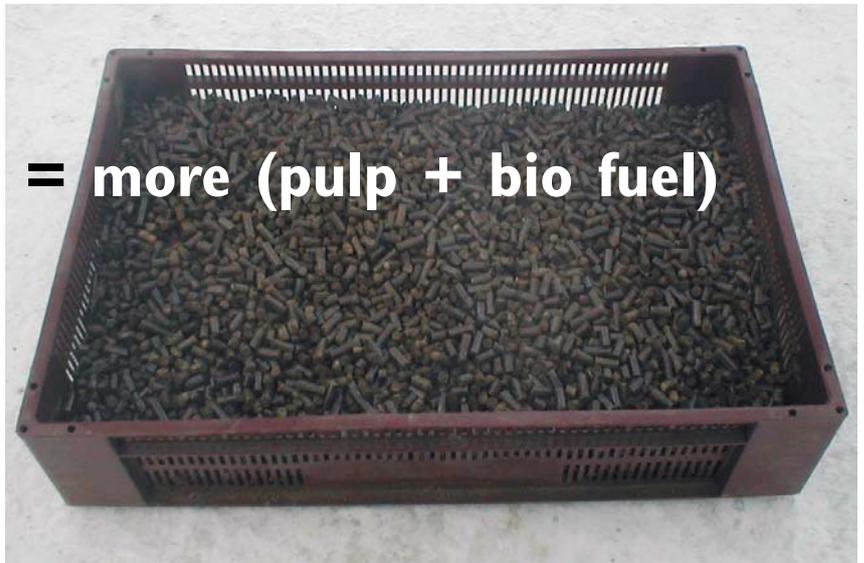
# New lignin process = more (pulp + bio fuel)

Separation of lignin from black liquor can be a very cost effective way of increasing pulp capacity. The lignin produced may be used as a replacement for mineral oil in lime kilns.

Per Tomani, Major Project Manager at the Fibre, Pulp and Energy Division, describes an interesting aspect of a research programme led by STFI-Packforsk, viz. FRAM (the Future Resource-Adapted Pulp Mill). A large R & D network carries out the work.

“To a large extent, the production of papermaking pulp can be compared to a closed-loop operation cycle. Firstly, wood chips are cooked to dissolve the lignin in a cooking liquid resulting in a liquid called black liquor and fibres are produced. Lignin can be characterised as a bearer of energy. It is actually transformed in the soda recovery boiler to steam energy, which is utilised to operate the pulp and paper making processes. At the same time, the cooking chemicals in the black liquor are converted to a re-usable state so that they can be reprocessed and used for cooking more wood chips.”

With this new lignin process, large quantities of lignin can be removed before reaching the soda recovery boiler. The lignin is reprocessed, producing a separate bio fuel in powder form that can be compressed into briquettes or pellets. Furthermore, the new quality of the lignin is purer than that which has been previously produced. It is more cost efficient too. The lignin can be used as



energy straight in the production, e.g. in a bark furnace or a lime kiln. Alternatively, it can be sold on the external fuel market. This is an attractive solution for replacing fossil fuels with bio fuel.

“The major potential of this lignin process is when the production of a pulp mill is limited by the thermal capacity of its soda recovery boiler, which is a typical case,” continues Per Tomani.

“Separating lignin from black liquor, which in turn results in de-bottlenecking in the soda recovery boiler, makes it possible for a mill to increase its production of pulp fibres. Investing in such a system can prove to be very profitable indeed.”

The basic notions of a new lignin process were already being developed back in 1998, in a research programme dealing with the Ecocyclic Pulp Mill (the KAM Programme). Those ideas have now evolved from laboratory scale tests to a large scale pilot-trial, where 7 to 8 tonnes of lignin were produced during trial runs over a period of a few days. The results of the FRAM Programme have been very successful, owing to an excellent network that was being formed during the KAM Project. It all goes to show how important continuity can be.

The partners supporting and participating in the development of the new and more cost efficient processes for lignin separation are Stora Enso, Södra Cell, Borregaard LignoTech, Bäckhammars Mill, Fortum Värme, Sydkraft, EPCON, ÅF-Celpap, Orelis AGA, Larox, Minrox, Glommers Miljöteknik, Chalmers University of Technology, Lund Institute of Technology and the Mid Sweden University in Sundsvall. Other important financiers are the Swedish Energy Agency, Mistra and ÅForsk. Among other things, this work has resulted in two patents that will be further developed, a new process design and the production of several tonnes of high quality lignin fuel plus,

from a general point of view, new and significant breakthroughs in knowledge and know-how.

The FRAM Programme will come to an end in the middle of 2005. STFI-Packforsk is looking for partners interested in continuing on to the next step, i.e. accomplishing a commercially available lignin process. The next stage will hopefully be a development plant at a mill whose production is in the order of 5,000 to 10,000 tonnes of lignin per year and a research programme that provides support for developing the process and new products. One of the expectations is to achieve continuity in the network activities and, with that, start with the next stage as early as the second half of 2005. ●

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Per Tomani.

PHOTO: LARS NYBOM

 Att separera lignin från svartlut kan vara ett mycket effektivt sätt att öka massakapaciteten. Det lignin som utvinns och upparbetas kan dessutom användas som ersättning för fossila bränslen.

Inom forskningsprogrammet FRAM (the Future Resource-Adapted Pulp Mill) har en ny ligninprocess utvecklats där stora mängder lignin kan separeras innan det når sodapannan. Det ger ett separat biobränsle som är renare än vad som tidigare uppnåtts. Ligninet kan komprimeras till pellets, till exempel för användning direkt i den egna produktionen. Även kokkemikalierna i svartluten kan omvandlas för uppabetning och ny användning.

Ligninsepareringen som också minskar flaskhalsar i sodapannan gör det möjligt att öka produktionen av massafibrer. Den största potentialen för processen är när en massafabrik är produktionsbegränsad av sodapannans termiska kapacitet.

# New cluster research programme so

Work on the new STFI-Packforsk cluster research programme for 2006–2008 has now entered an intensive phase. “We are working very closely with our Partner Customers and advisory groups and, during this time, we are compiling suggestions for a new Research Programme,” says Anders Pettersson, Division Manager at STFI-Packforsk.

“The next research programme for the pulp and paper industry will extend over a three year period. The balance-sheet total is approximately SEK 300m,” continues Anders Pettersson. This is equivalent to almost half of the entire STFI-Packforsk budget.

Work on the planning of a new research programme takes 18 months. Discussions are carried out with the customers about interesting ideas and suggestions for the new research activities that should be included in the next programme. Next, STFI-Packforsk gives further attention to the suggestions and they are evaluated by the company’s Research Council, which consists of professors from Swedish uni-

versities and is chaired by a representative from the industry.

“Subsequently, and this is the stage we are at right now, it is time to write a new version of the proposals, which are to be discussed with our Partner Customers,” says Anders.

By the middle of the year, a final draft proposal for a research programme will be ready, so that companies can allocate money to the various areas of research that they want to take part in.

### Continuing research for increased flexibility

Anders Pettersson continues, “There is a disadvantage to starting and ending very big research programmes at the same time. This creates an uneven load on our operations, such as on laboratory resources at the start and the finish of project periods.”

“But the biggest disadvantage is that flexibility diminishes when you can only begin a research project every third year. New ideas and demands for research come to light all the time a research programme is in progress.”

“That’s the reason why we’ve already started some research projects, now in



The frequent opportunities arising for experts from STFI-Packforsk on going research projects are a guarantee that new suggestions will have scientific value, suggestions are put forward to the Research Council.

2005. ‘Tess II’ (The Engineered Sheet Structure) has already begun, so too ‘Printing and New Functions in Packaging’. The next in line are ‘Biorefinery’ and ‘Recycled Fibres’. It is still possible for new customers to take part in the latter three.” ●

## STFI-Packforsk Research Council

STFI-Packforsk has appointed a scientific Research Council, consisting of a number of top class Swedish researchers representing important branches of learning in the Company.

“It is very valuable to have a seriously committed and qualified Research Council, acting in a supporting capacity with visionary work and assisting in the evaluation of research activities,” says Anders Pettersson.

The Research Council comprises eight members from various disciplines.

The following are members of the Council:

Thomas Berglin, Research Director, EKA Chemicals AB (Chairman)

Gunilla Jönson, Professor, Packaging Logistics/Principal, Lund Institute of Technology

Peter Gårdenfors, Professor, Cognition Research, Lund University

Nils Enlund, Professor, Graphics Technology, Royal Institute of Technology, Stockholm

Bengt Kasemo, Professor, Physics and Technical Physics/Nanotechnology, Chalmers University of Technology, Göteborg



Anders Pettersson, Division Manager at STFI-Packforsk is the spider spinning the web and the person responsible for the new 2006-2008 Research Programme.

# on ready



...sk and industry representatives to exchange ideas during on-  
...l be highly relevant to the industry. To further guarantee their  
...ncil for consideration.

Björn Lindman, Professor, Physical Chemistry, Lund University

Henrik Alfredsson, Professor, Mechanics/Fluid Mechanics for Engineers, Royal Institute of Technology, Stockholm

Karl Åström, Professor, Mathematics, Lund Institute of Technology

The Research Council fills several functions. It acts as a support; it scrutinises and aids the Company in investigating the front lines in science.

Apart from the Research Council, STFI-Packforsk has also set up two Advisory Boards, one in the field of Packaging and one in the field of Printing and Media. ●

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Arbetet med att ta fram STFI-Packforsks nya forskningsprogram för åren 2006-2008 är inne i ett intensivt skede.

– Vi arbetar mycket nära våra avtalskunder och referensgrupper när vi tar fram förslag till nya forskningsprogram, säger Anders Pettersson, divisionschef vid STFI-Packforsk.

Vid halvårsskiftet ska det relativt färdiga förslaget till forskningsprogram ligga klart så att företagen kan fördela pengar inom vilka olika forskningsområden man vill medverka. Ett nytt kluster har dock redan startat och ytterligare två ligger i startgroparna. Detta ger ökad flexibilitet och effektivare utnyttjande av exempelvis laboratorieresurser.

För att säkerställa att förslagen håller nödvändig vetenskaplig kvalitet, utvärderas de även av STFI-Packforsks forskningsråd. Rådet består av åtta medlemmar, i huvudsak professorer från olika discipliner inom svenska universitet och högskolor.

## More research for the money

Holmen, a forest industry Group, and STFI-Packforsk go back a long way. During their history together, they have both gone through many sweeping changes.

When asked why Holmen is an STFI-Packforsk Partner Customer, Holmen Technical Director, Sven Wird replies:

“It is important for Holmen that there exists a sturdy R & D Institute in our line of business. In general, STFI-Packforsk acts as an excellent support to Holmen. The Institute is a meeting-point for our industry. It is of such magnitude as to be able to link together and manage large programmes, for example, the new EU Project. And it provides a world-class environment for research training courses. Naturally, our history and geographical position contributed to the reason why we have chosen a first-rate company like STFI-Packforsk as our biggest R & D supplier.”

“In most of the cases, it is not a problem for Holmen to participate in research projects along with our competitors at STFI-Packforsk. Research gives a general knowledge structure. If you then want to further develop certain ideas to explore how they work just under the conditions we have at Holmen, there is always the opportunity of arranging a separate assignment, an opportunity which Holmen is more and more taking advantage of.” As Sven Wird expresses it, “In a research programme, the aims are broad but, in a development project, the aims are more specific.”

“In principal, the research pursued at STFI-Packforsk is the only research that Holmen invests in. Along with the other Partner Customer investments and with the addition of the public resources that STFI-Packforsk has succeeded in having appropriated, the returns are colossal. Then there are the other components of the research network, in which STFI-Packforsk participates. The outcome is an



Sven Wird är teknisk direktör i Holmen. På frågan varför Holmen är avtalskund hos STFI-Packforsk svarar han:

– Det är viktigt för Holmen att det finns ett starkt FoU-institut i branschen. Institutet är en samlingspunkt för branschen och en förstklassig miljö för forskarutbildning, samt har storleken att kunna knyta ihop och leda stora program.

Den forskning som bedrivs på STFI-Packforsk är i princip den enda forskning Holmen investerar i. Tillsammans med övriga avtalskunders investeringar och med tillägg av de offentliga medel som STFI-Packforsk lyckas få beviljade blir utväxlingen stor. Därtill kommer övriga delar ur de forskningsnätverk som STFI-Packforsk deltar i. Denna forskning är en mer generell kunskapsuppbyggnad. Vill vi utveckla vissa idéer vidare för att se hur de fungerar just under Holmens förhållande finns möjligheten att lägga enskilda uppdrag, vilket vi utnyttjar mer och mer.

enormous amount of research, when one considers how much money is actually invested.”

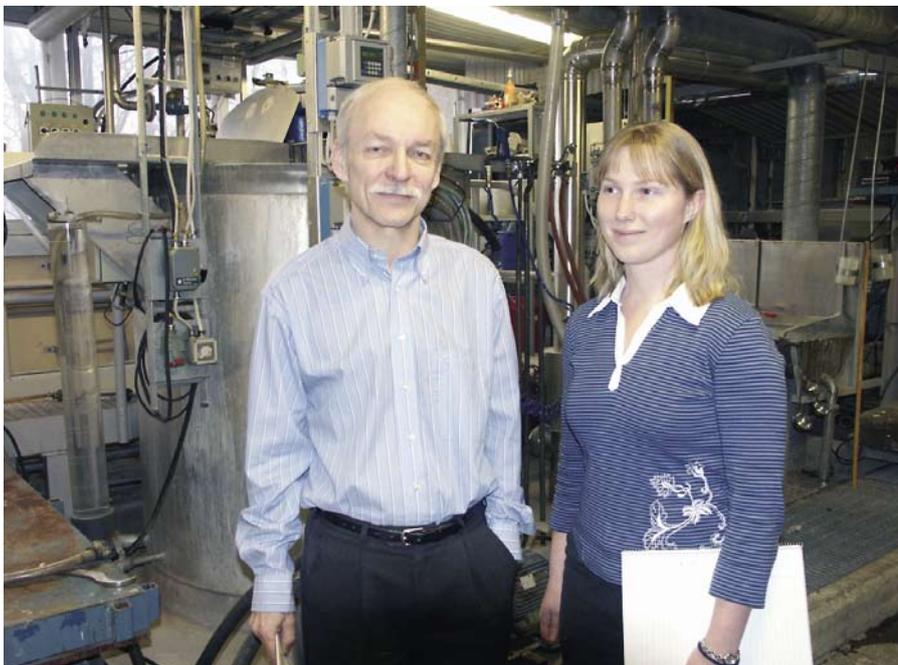
“A big issue at Holmen just now is how we will be able to identify and make use of all the promising results that are being produced.”

“It’s important to have active representation on the Cluster Advisory Boards of the research programmes,” says Sven Wird. “But Holmen is big and the mills have many varying interests, so the demands on our representatives to see the potential for the whole of Holmen are great. For a year now, there have been two STFI-Packforsk employees attached to Holmen. These people have good insight into the prioritisation and approaches to problems that exist at Holmen and they function somewhat as ‘technology brokers’. We maintain constant discussions with STFI-Packforsk in order to ensure we optimise the return on Holmen’s research investments.” ●

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PHOTO: HOLMEN



According to Lars Sjöström and Ida Östlund, the RODET test-runs produced a very good example of the unique opportunities offered by EuroFEX for research and development.

 **RODET** är ett EU-projekt som studerat metoder för att reducera störsubstanserna i det cirkulerande vattnet vid papperstillverkning. En del av projektet har varit att utveckla nya kemikalier som kan ta bort en del av det störande materialet och leda till att vattnet kan återanvändas i större utsträckning. Fler än 30 kemikalier har producerats och testats i laboratorier.

Genom det europeiska samarbetet har det varit möjligt att testa kemikalierna på processvatten från olika typer av massor, i Sverige på massa från nyfiber och i central- och sydeuropa på returfiber massa.

Efter laboratorieförsöken utfördes tester på STFI-Packforsks pilotpappersmaskin EuroFEX för att undersöka kemikaliernas effekt på störsubstanserna och eventuell inverkan på pappersegenskaperna. För att fullt ut verifiera forskningsresultaten utfördes sedan fullskaleförsök i pappersbruk med goda resultat.

## Best water for top quality

One problem with paper production is the compounds that escape into the circulation water, causing disruption to production, with impaired product quality being a consequence. Due to strict environmental standards, today's trend is to reduce water consumption, which is leading to an increased content of troublesome substances in process water.

"You could liken this to using the same washing-up water several weeks in a row," says Ida Östlund, one of the STFI-Packforsk researchers participating in RODET, a European research project. "Recently, this project that was working to find methods for reducing troublesome substances came to an end. One method is to add chemicals that are able to remove a certain amount of the troublesome compounds. By this means, and to an ever increasing extent, it should be possible to recycle the process water without impairing the properties of the paper."

One aspect of the project has been to develop new chemicals. More than 30 chemicals have been produced and tested in the laboratory. Owing to this joint European project, with participants from 9 different companies and universities, it has been possible to test chemicals in process waters coming from various kinds of pulps. In Sweden, it concerned pulp from virgin fibres and, in central and southern Europe, from recycled fibres.

"On the whole, there has been a good mix of people involved in the project," says Lars Sjöström of STFI-Packforsk. He is referring to the researchers, chemical suppliers and paper producers who

have all had important functions to fill, while everyone has benefited from the co-operation involved. The three chemical suppliers have had the opportunity of producing and testing new chemicals that would not have been developed without prior laboratory testing in the research institutes.

Following the laboratory tests, trials were carried out on EuroFEX, the STFI-Packforsk Pilot Paper Machine, to examine the effects of the chemicals on troublesome substances and their probable influence on paper properties.

Lars Sjöström adds, "There's always a risk that new chemicals might impair certain paper properties, but the EuroFEX trials showed no signs of it."

Nevertheless, full-scale paper mill trials had to be carried out in order to verify the research results properly. Full scale trials with one of the new chemicals produced such good results that one paper mill has decided to extend its trial period, in spite of the fact that the project has come to an end. ●

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## STFI-Packforsk active in many EU Projects

One of the assignments that STFI-Packforsk has been given by its Partner Customers is to act as a uniting force when it comes to European research ventures. Apart from research itself, this task includes the scrutinizing of announcements and proclamations, as well as lobbying and the co-ordinating of projects. Although there has been a lot accomplished, the EU Projects are just one part of the Company operations. Participating in these projects means facilitating an increase in interchanges with the other parties that are involved in the research areas where STFI-Packforsk is active.

Another role has been to create opportunities for investing in venture-some ideas and projects that could be classified as more on the risky side. It is vital to achieve a balance among *Exploratory Research* (EU Projects, etc.), *Industrial Research* and *Consulting* in order to attain an efficient flow from the conceptual idea to an application in the mills and plants of the STFI-Packforsk customers. Today STFI-Packforsk is active in almost 20 EU Projects to varying degrees. You can read about two of these projects, RODET and ECOTARGET, in this issue. ●

# Research education at STFI-Packforsk

STFI-Packforsk stands in a unique position between the university and the industry, as a link between the sciences and their applications. Research students offer the Company long-range research, vital for generating knowledge, which is then introduced into the industry, partly through various research projects and networks and partly by the students themselves. Research education at STFI-Packforsk has long been an excellent recruitment basis for the industry.

In 2004, six doctors and thirteen licentiates at STFI-Packforsk graduated.

The theses (see titles and names below) can be ordered from [www.info@stfi.se](mailto:www.info@stfi.se) at a cost of SEK 275 per title, including VAT.

## Doctoral Theses 2004

Mikael Gällstedt

Films and composites based on chitosan, wheat gluten or whey proteins – Their packaging related mechanical and barrier properties

Mikael Krook

Packaging related properties of polymer nanocomposites and pulp fiber/polymer blends and laminates

Jan Lif

Analysis of the time and humidity-dependent mechanical behaviour of paper webs at offset printing press conditions

Siv Lindberg

Perceptual determinants of print quality

Vinicius Lobosco

On the modelling of mechanical dewatering in papermaking

Per V Persson

Strategies for cellulose fiber modification

## Licentiate theses 2004

Jonas Bergström

Fiber suspension velocity measurements in a cylindrical through-flow hydrocyclone

Isabel Endres

Compression uniformity measurements on coated and uncoated paper surfaces

Gustavo Gil Barros

Optical topographical characterisation for flexographic printability assessment

Orlando Girlanda

Experimental study and numerical simulation of delamination in multiply paperboard during offset printing

Erik Hallberg

Print quality of post-printed corrugated board



Elisabet Horvath

Appropriate conditions for polyelectrolyte titration to determine the charge of cellulosic fibers

Cecilia Land

Laboratory method for the study of moisture-induced waviness in paper

Martin Löfgren

Packaging and customer value. A service perspective

Behudin Mesic

Printability of polymer-coated board

Cristian Neagu

Hygroelastic properties of wood fibres for composite applications

Erik Svanholm

An experimental study of inkjet receptive coatings. Effects of poly(vinyl alcohol) and silica on printability.

Henrik Ullsten

Barrier plastics, processing of wheat gluten and a new method to measure permeability

Magnus Viström

Customised information on packaging – driving forces and logistical aspects

Peter Åslund

Dynamic measurement of water-induced roughening in paper surfaces by a new optical method

## COMING EVENTS

### MARCH

- 9–10 Annual meeting Normpack
- 14–17 Packaging Diploma Course, session II
- 15 Information day – Chemical pulp
- 16–17 Advanced Training: Pulp producer possibilities of influencing fibre properties – chemical pulp

### APRIL

- 4–5 Pulp and Paper Chemical Analysis Seminar
- 5–6 Advanced Training: Properties of paperboard for converting and end-use
- 19–20 Advanced Training: The 3-D structure of paper
- 27 Advanced Training: NPE – non-process elements in kraft pulp mills

### MAY

- 9–12 Packaging Diploma Course, session III
- 10–11 Advanced Training: White water and retention chemistry in closed systems
- 24–25 Advanced Training: Evaluation of print quality

### JUNE

- 14–16 SPCI 2005

## 3rd Pulp and Paper Chemical Analysis Seminar

STFI-Packforsk, Stockholm  
4–5 April 2005

For information: [www.stfi-packforsk.se](http://www.stfi-packforsk.se)



A new sign welcomes visitors to STFI-Packforsk.

## Have you changed address?

Please let us know by sending an e-mail to [info@stfi.se](mailto:info@stfi.se).

# B



# Forest SOS

After the extensive gale force winds that ravaged the south of Sweden at the beginning of January this year, forests worth billions of kronor have been flattened to the ground, waiting to be dealt with before the spruce bark beetle and other pests start getting their teeth into things. In just a few hours, the number of trees blown down was equivalent to the volume of one year's entire felling in the whole of Sweden. Enough timber has been blown down in the worse stricken areas to last for several years.



PHOTO: MATS SAMUELSSON

The volume is so large that even mills in the north and, probably, those in our neighbouring countries will have to help out in taking care of it. Wood from this area, which will be new for the mills, may have other properties than those from the usual suppliers, due, for example, to different growing conditions. This means that the fibres in the wood are not the same and this could have an effect on pulp products from those mills.

Quite soon after the gales had occurred, STFI-Packforsk received requests asking for help with assessing the consequences of using a raw material that was different. The first answers could be provided within 24 hours.

Sven-Olof Lundqvist, Major Project Manager at the Paper Making Division, explains that this was possible owing to the databases, models and simulation tools that have undergone on-going development at STFI-Packforsk over the course of several years.

"We usually utilise these tools to calculate the differences in the properties of forests, wood and fibres coming from various origins and we predict how these affect the mill products and processes, both for research purposes and for coming up with solutions for mills and companies. Now it has been shown that these tools were perfectly suited for use in this crisis situation."

"To make an optimal choice of wood and fibre processes, it is necessary to have an overall view from the forest to

the product, logistics, costs etc. Solutions, which vary from mill to mill, can be complicated to come up with. That's why there is a need for efficient tools."

For ten years, STFI-Packforsk has worked with a strategy for developing the know-how and tools for the optimal utilisation of forest raw products for producing pulp and paper. All the while, the aims have been for improved papers and more efficient production methods. Measuring instruments have been steadily developed for the most important wood and fibre properties; databases have been built up for identifying variations in the properties of different forests, trees and tree parts; models and calculation tools have been developed for descriptions of these and relationships between the properties of fibres and paper. By means of these tools, the entire chain can be linked together. This is now possible, at least qualitatively.

A unique and very forceful addition to the STFI-Packforsk Wood and Fibre Measurement Centre is an instrument called SilviScan. SilviScan can determine many significant properties of wood and fibres with a high resolution. This instrument provides completely new opportunities for R & D in a great many areas. When making estimates of the effects of the gale damage, information from SilviScan measurements was used as a basis for the calculations.

"Our aim is to increase the knowledge of how to exploit properties for optimis-

ing the use of the raw material for better properties and costs," says Sven-Olof Lundqvist.

"That we are deeply-rooted in the industry is one of our strong points. We are becoming more and more engaged on the international scene. On top of this, two of our other strengths include an excellent infrastructure and our vast experience with developing measurement techniques." ●

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SOS från skogen. Efter den stora stormen i Sydsverige kommer virkesflödet att även gå till pappersbruk i norra delarna av Skandinavien. Veden kan dock ha egenskaper som är nya för dessa bruk vilket kan påverka processer och produkter.

STFI-Packforsk har under många år byggt upp databaser, modeller och simuleringsverktyg för att uppskatta skillnader i egenskaperna hos skog, ved och fibrer med olika ursprung och deras påverkan. I SilviScan har bolaget fått ett nytt, avancerat tillskott som ger helt nya möjligheter till forskning och utveckling på en mängd områden. I den oväntade krissituationen har data från SilviScan och övriga resurser kunnat utnyttjas för olika beräkningar.

Styrkan hos STFI-Packforsk i mätteknikutvecklingen är bland annat förankringen ute i industrin, det internationella engagemanget och den mångåriga erfarenheten.



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