VIPP VALUES CREATED IN
FIBRE-BASED PROCESSES
AND PRODUCTS

THE VIPP NEWSLETTER #11

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ACADEMIC RESEARCH WILL BENEFIT THE CREPING PROCESS AND THUS PRODUCT PERFORMANCE AND SUSTAINABILITY

Creping is an important unit process in tissue making where a blade separates the dried paper from the drying cylinder. This action influences many product properties such as softness, absorbency and strength of the tissue paper. In his doctoral studies, Pyry Hämäläinen, has focused on gaining more knowledge of the creping process.

“The creping process is influenced by several chemical, mechanical and operational factors which in all make this key section of tissue making a complex phenomenon to study”, says doctoral candidate Pyry Hämäläinen.

Trials on a full scale tissue production machine are time consuming and can jeopardize the Yankee dryer cylinder, a critical component of the production equipment. Therefore, a laboratory scale creping simulator that addresses the actions in the creping process, in as near as possible to production conditions, would be very advantageous.

“During this project a high speed creping simulator has been developed*, and now patented”, says Pyry Hämäläinen. “The new simulator is based on a horizontal design which allows high speed and accurately controlled process step durations comparable to tissue machines together with flexibility for modifications and efficient operation.”

Special attention was given to the process parameters of the creping action (i.e. speed, temperature, and forces) and the flexibility of the simulator (feasibility to change conditions and materials/ components), see Figure 1.

Currently, validation of the creping simulator is going on, including operational factors such as drying temperature, creping speed, and grammage of the sheet, geometry of the creping blade and the interplay with the creping chemicals. Additionally, the mechanics of the creping action is investigated. Moreover, the development of Finite Element description of the paper creping is under way.

In the first half of 2017, Pyry Hämäläinen will present his study at a dissertation seminar.

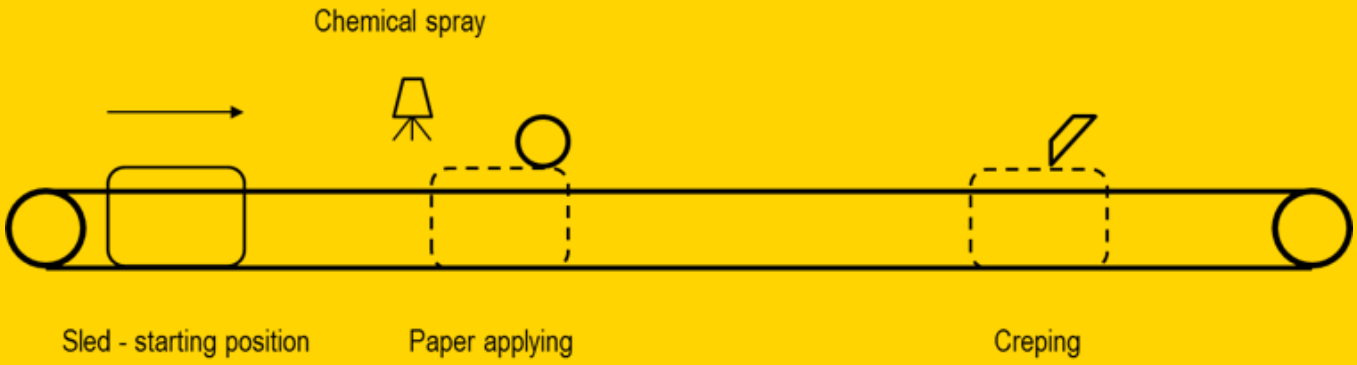

Figure 1. Schematic drawing of the new high speed creping simulator.

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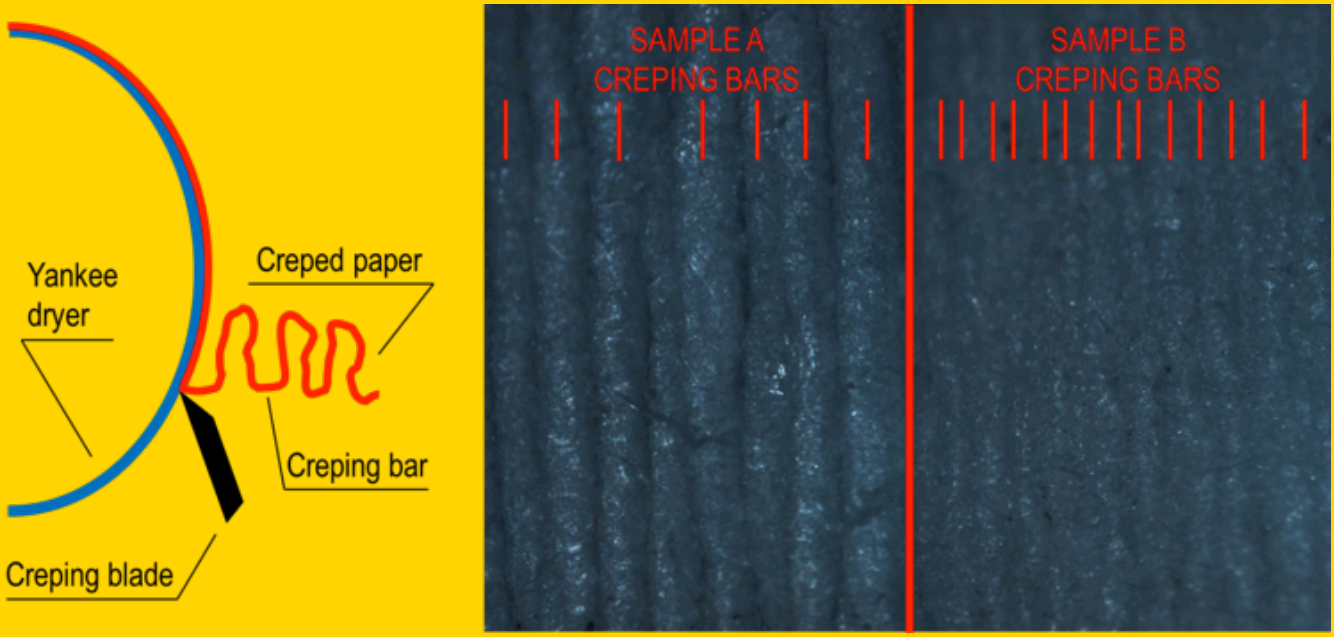

Figure 2. Schematic drawing of the creping process in a full scale tissue machine on the left and the influence of creping blade tip angle to the amount of creping bars on the right. Samples A and B are creped in the new creping simulator, when evaluating the performance of different furnishes.

Reference:

*Hämäläinen, P., Hallbäck, N. and Barbier, C. (2016): Development and evaluation of a high speed creping simulator for tissue, Nordic Pulp & Paper Research Journal, 31(3), pp. 448-458.

Name:	**Pyry Hämäläinen**
Company:	**Kemira**
Project start:	**February 2012**
Supervisors KAU:	**Associate Professor Nils Hallbäck, Professor Magnus Lestelius**
Examiner:	**Professor Lars Nilsson, Karlstad University**
Company mentor:	**Mikko Mäkinen, Senior Research Scientist, Kemira**

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THE FIRST PUBLIC DEFENCES OF VIPP DOCTORAL THESES ARE APPROACHING

In December it is time for VIPP's first doctoral public defences when Christer Gustavsson and Raghu Deshpande will defend their respective doctoral thesis.

Christer has been a VIPP PhD for five years and Raghu for four years and now they can see the end of their respective doctoral projects.

"It's been an extremely rewarding time", says Christer Gustavsson. "One of the advantages with VIPP was that I could develop the research question together with the company and the university during the process. I started with a broader question and could narrow it down gradually."

Also Raghu Deshpande is pleased with his four years with VIPP. "I think that there are many advantages with being a VIPP doctoral student and I've appreciated the many opportunities to authentic and practical learning."

Busy weeks are now ahead because there is a lot to prepare before the presentations.

"I'm pleased, after all the public defence has been the goal for the past four years," says Raghu, who will continue as a MoRe Research employee after VIPP. "If it's Ok with the company, I would like to continue doing research, but we'll see, nothing has been decided yet," he says.

Christer would like to continue his cooperation with academia. "I'll apply to be an affiliated researcher, which means working one day a week at the university. In this way I could continue studying the same area and be associated with a research environment at Karlstad University," he says.

Christer presents his study, titled "Added value from biomass by broader utilization of fuels and CHP plants" on 8 December. Raghu presents his study, titled "The initial phase of sodium sulfite pulping of softwood - A comparison of different pulping options" on 15 December.

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PLANNED LICENTIATE SEMINARS AND DISSERTATIONS

Planned lic seminars 2016
Anders Ottosson, Valmet, November 29

Planned dissertations 2016
Christer Gustavsson, Pöyry, December 8
Raghu Deshpande, Domsjö/MorRe research, December 15

Planned lic seminars 2017
Jonas Kihlman, Pöyry
Daniel Ekbåge, Stora Enso Group R&D
David Joelsson, SP
Lisa Mattson, BillerudKorsnäs AB
Per Myrén, SSG AB (half time seminar)

Planned dissertations 2017
Åsa Nyflött, Stora Enso (Q1)
Pyry Hämäläinen, Kemira (Q1)
Aron Tysén, Innventia AB (Q2)
Peder Bengtsson, Asko Appliances AB (Q2)
Asif Javed, BillerudKorsnäs AB (Q4)
Caroline Wilke, BTG Instruments AB (Q4)

Planned lic seminars 2018
Helena Cider Johansson, Härjeåns Energi AB

Planned dissertations 2018
Sofia Thorman, Innventia AB

COMPANY VISITS – AN IMPORTANT PART OF A SUCCESSFUL DOCTORAL PROJECT

An important task for a university employed VIPP supervisor is to make company visits. Roger Renström supervises Helena Johansson Cider and regularly visits Härjeåns Energi AB and P-O Berglund, head of maintenance.

The company visits take place every six months and are important building blocks in a successful doctoral project because the academic and industrial representatives meet and discuss the project.

”We discuss the progress of the project and the issues of industrial relevance involved in the research and the academic quality,” says Roger Renström. ”We tell them what we require to be able to use the data and they describe the questions that the project could explore more thoroughly.”

Vipp’s contact person at Härjeåns Energi AB, P-O Berglund, is very pleased with the cooperation.

”I think that there are many advantages with meeting face-to-face. Besides the focus on the project, we also discuss other matters that are beneficial to the company. Often we discuss operations and Roger may suggest improvements.”

Roger too thinks that the cooperation works well and that he greeted with interest and commitment.

”They are curious about what research can bring to their work and there is a great willingness to implement the results and ideas that we discuss. It makes me very happy!”

HÄRJEÅNS
ENERGI AB

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VIPP PARTICIPATION AT A CELLULOSE CONFERENCE

On 15-16 November the 7th Workshop on Cellulose, Regenerated Cellulose and Cellulose Derivatives will take place in Örnsköldsvik, Sweden. Raghu Deshpande will deliver a lecture, titled ”Lignin carbohydrate complexes in sodium sulfite dissolving pulps as a function of the pulping conditions used”.

The conference series, which was initiated by Ulf Germgård, professor of Chemical Engineering at Karlstad University, in 2003 and has since then been organised every second year.

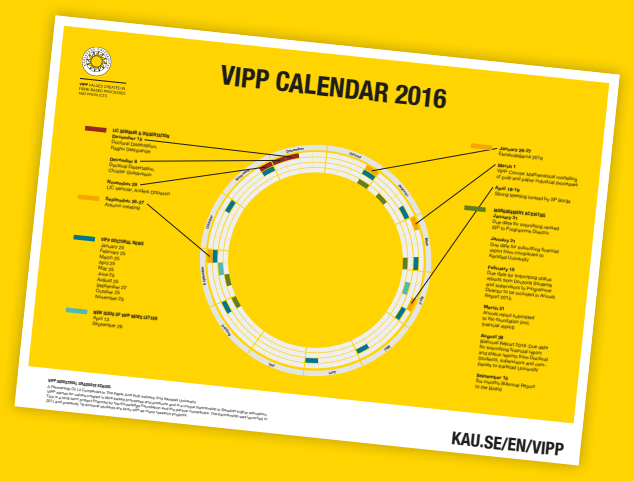
“Cellose is a very interesting material which can be used in more ways than paper and packaging materials,” says Ulf Germgård. ”Many researchers and developers work on producing diverse goods which in the long run may replace many oil- and carbon-based products. The new products being developed will, for example, be used in textiles, or replace plastic and steel in cars.”

The aim of the conference is to gather researchers and industrial representatives to exchange experience and ideas in this field.

The workshop is sponsored by leading suppliers of dissolving pulps and machinery, which guarantees that the workshop will have a mix of academic and applied presentations. There will be approximately 20 oral papers and 10 posters, covering topics such as: Cellulose chemistry and derivatives, Cellulose structures, Dissolution of cellulose, Dissolving pulp preparation and properties. Ninety participants from around 15 countries are expected to attend the conference. The next workshop will take place at Karlstad University in 2018.

VIPP CALENDAR 2016

Don’t miss the Vipp Calendar of 2016.
You find a printable version at **kau.se/en/vipp**.



MoRe Research

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Domsjö

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