



VIPP VALUES CREATED IN
FIBRE-BASED PROCESSES
AND PRODUCTS

THE VIPP NEWSLETTER #9

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LICENTIATE SEMINAR

THE INITIAL PHASE OF SODIUM BISULFATE PULPING OF SOFTWOOD DISSOLVING PULP

The Licentiate dissertation took place on September 25th in Nyquist Hall at Karlstad University.

The sulfite pulping process is today practiced in only a small number of pulp mills around the globe and the number of sulfite mills that use sodium as the base (cation) is less than five. However, due to the increasing interest in the wood based bio refinery concept, the benefits of sulfite pulping and especially the sodium based variety, has recently gained a lot of interest. It was therefore considered to be of high importance to further study the sodium based sulfite process to investigate if its benefits could be better utilized in the future in the production of dissolving pulps. Of specific interest was to investigate

how the pulping conditions in the initial part of the cook (≥ 60 % pulp yield) should be performed in the best way.

Thus, this thesis focus on the initial phase of single stage sodium bisulfite cooking of either 100 % spruce or 100 % pine wood chips. The cooking experiments were carried out with either a lab prepared or a mill prepared cooking acid and the temperature and cooking time were varied. Activation energies for different wood components were investigated as well as side reactions concerning the formation of thiosulfate and sulfate.



Name:	Raghu Deshpande
Examiner:	Associate professor Martin Ragnar, Energiforsk AB
Main supervisor:	Professor Ulf Germgård, Chemical Engineering at Karlstad University



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SUCCESSFUL SUPERVISION – A KEY FACTOR

The success in the doctoral studies is much dependent on the supervisors' ability to supervise. Supervisors influence students with their own preferences and experiences.

– The value of the projects are not only constituted by the results and research, but also of the individuals who acquire skills and knowledge that are unique, says Magnus Lestelius, professor of Graphic Technology at Karlstad University.

On two occasions in 2014 and 2015, supervisors from both the industry and the university attended a course in doctoral supervision. The participants gave positive feedback and said that they became aware of new aspects on their supervision.

Now, the educational initiative has come to an end, and the next step will be to hold supervision meetings with focus on discussions and experience exchange. The first meeting will take place at the VIPP Autumn Meeting on September 28th where the supervisors within VIPP will discuss the interpretation of learning outcomes and the so-called matrices that are employed as a tool to assess overall fulfillment of learning outcomes.

– I see a great value in continuing this experience exchange with the supervision meetings. It's of great importance for the supervisors and also for the doctoral students' education and ambitions to become independent researchers we assist and supervise, Magnus Lestelius concludes.





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PRESENTATION OF DOCTORAL STUDENT – DANIEL EKBÅGE

RESOURCE EFFICIENCY CONCEPTS FROM IMPROVED TECHNIQUES IN THE PULP AND PAPERBOARD PRODUCTION PROCESSES

The tentative title of the project is "Resource efficiency concepts from improved techniques in the pulp and paperboard production processes". The research project partly aims to study possibilities to identify processes, sub-processes or equipment which show significant improvement regarding efficiency comparing installed techniques and best available techniques. An integrated paper- or paperboard mill consists of several processes connected by a number of flows of mass and energy. One objective is to analyze and develop knowledge of these streams by performing simulation modelling or similar techniques with focus on resource efficiency. The basis for the analysis is an integrated production site which provides valuable process data as input for many activities in the project.

Since project start in September 2014 the main focus has been on identifying processes relevant for extended analysis. The first study

has mainly involved identification of energy recovery potentials within the chemical recovery area by developing a tailor-made software for analysis and graphical representation of the streams.

I have a Master of Science degree in Mechanical Engineering from Luleå University of Technology. After my graduation in 2003 I have been working as a technical consultant mostly within mechanical analysis and design. In addition I've had a position as System Integration Leader in the wind industry. In 2011 I got employed by Stora Enso Research Center as a Research Engineer/Project Leader, focusing on converting technologies of packaging materials.

The doctoral studies give me a great opportunity to dig deeper within my field of interest, and also gives me the chance to reach enhanced skills in areas that are somewhat new to me.



Name:	Daniel Ekbåge
Project start:	September 2014
Supervisors KAU:	Lars Nilsson, Helena Håkansson



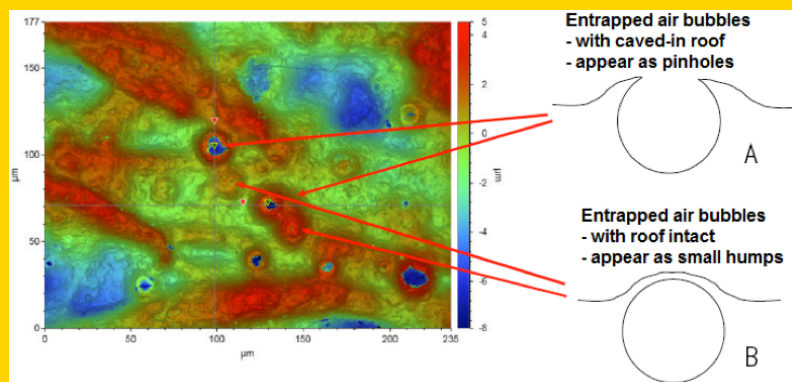


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SURFACE PROFILER - IMPROVED ANALYTICAL TOOL FOR ANALYSES OF SURFACES AVAILABLE WITHIN VIPP

Researchers within VIPP have received a grant from Stiftelsen Nils och Dorthi Troëdssons forskningsfond (Troëdsson Foundation) for a new surface profiler. This instrument will facilitate mapping of coating thickness in the xy plane as long as the coating is transparent. This will enable quick and accurate analyses of e.g. PE layers. This surface profiler will also be used in characterization of other paper products. The Figure shows an image of barrier coated paper with defects

(pinholes) captured by the surface profiler. Beside information about roughness, the Figure also gives insight in the process when pinholes are evolved, as indicated by surface defects at different stages towards formation of a complete pinhole. For more information about our new instrument, please contact Prof. Lars Järnström, phone +46 54 700 1625. Email Lars.Jarnstrom@kau.se.





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CALENDAR

COURSE

**20-21 OF OCTOBER, 11-12 OF NOVEMBER AND 8-9 OF DECEMBER
INDUSTRIAL MARKETING AND BUSINESS MODELS, 4 ECTS CREDITS**

The course gives an introduction to research within industrial marketing and business models, how research findings can be used in the change of production industry to a more service oriented business model. We will also discuss the need for further research within this field as well as critically examine the present marketing and business models research.

Lecturers: Nina Löffberg and Maria Åkesson
Please register to carin.bergstrom-carlsson@kau.se by 11th of October

**4-6 OF NOVEMBER
CHEMICAL ENGINEERING PROCESSES 1,5 ECTS CREDITS**

The course will give an overview of typical chemical engineering processes (such as drying, separation, filtration, pumping etc.) and in what industry sectors these are used (like pulp and paper, food, pharmaceuticals, chemical and petrochemical industry). In the course, the conditions for raw materials access, market and know-how will be discussed. Value creation B2B- and B2C-relations and sustainability are also topics for the course.

Lecturer: Magnus Lestelius
Please register to carin.bergstrom-carlsson@kau.se by 21st of October

**23-24 OF NOVEMBER
SUSTAINABLE DEVELOPMENT 3 ECTS CREDITS**

The course consists of eight hours of lecture, discussion, reflection in groups and an individual work of about 25 hours in which the student identifies and present aspects of how their own thesis project affect resource use, environmental impacts, social and economic issues in relation to chosen system.

Lecturer: Helén Williams
Please register to carin.bergstrom-carlsson@kau.se by 9th of November