

PROMINENT TECHNOLOGICAL COMPETENCE: FIBRE PROCESSES



Business from technology



PAPERMAKING PROCESSES - COMPETENCE

- Development of new energy efficient unit processes and concepts for papermaking
 - Our aim is to develop end-product properties and manage production using different raw material and process concepts.

- Competence is based on the control and development of various technologies:
 - Papermaking sub-processes
 - Fibre suspension flow
 - Wet web rheology
 - Impact of raw materials on the end product
 - Control of secondary flows in the pulp and paper industry
 - Mechanical fibre processing



KNOW-HOW

- Strong rheological expertise, which is based on fibre suspension flow research, can also be applied in other industrial fields.
- Paper structure and runnability research laboratories with analysis methods is available for research and development projects related to web forming, dewatering, process chemistry, and the runnability of paper machines.
- Strong know-how in separation technique and fractioning expertise can be utilised in new applications in Biorefine field and in the cleaning of secondary flows.

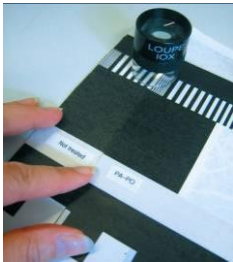


OUR COMPETENCE IS BASED ON

- **Over 30 inventions transferred to industry**
 - Results utilised in commercialised applications: new generation of headboxes, impingement drying concept and novel measurement techniques
- **Main customers industries:** Global pulp and paper, chemical and paper machine manufacturing companies
- **Unique research infrastructures** developed together with industry:
 - Raw material handling
 - Fluid dynamics
 - Papermaking
 - Filtration and separation
 - Paper structure and runnability
- **55 research persons: 12 post-graduate degrees** (5 doctoral degrees), 8 on-going doctoral studies.
- **Research partners:** KCL, STFI, KTH, TKK, JyU, ÅA, University of Maine, University of British Columbia

NEW POTENTIAL HIGH GROWTH OFFERINGS

For pulp, paper and board producers



For chemical suppliers



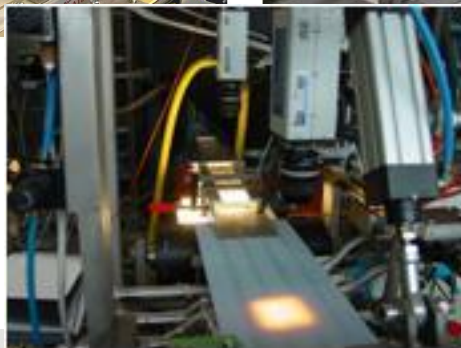
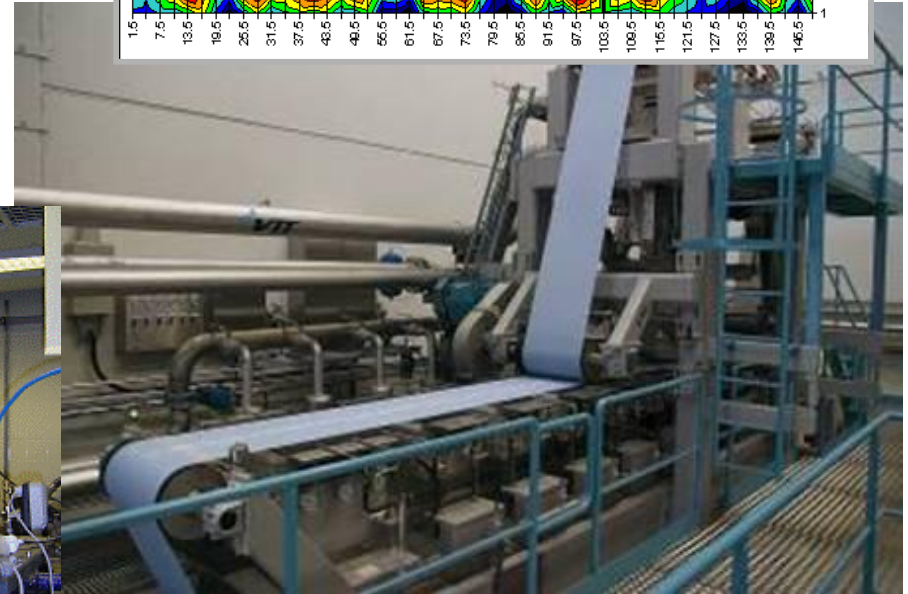
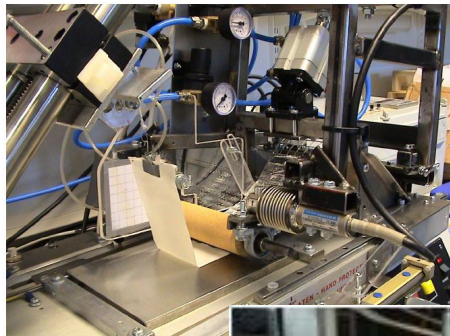
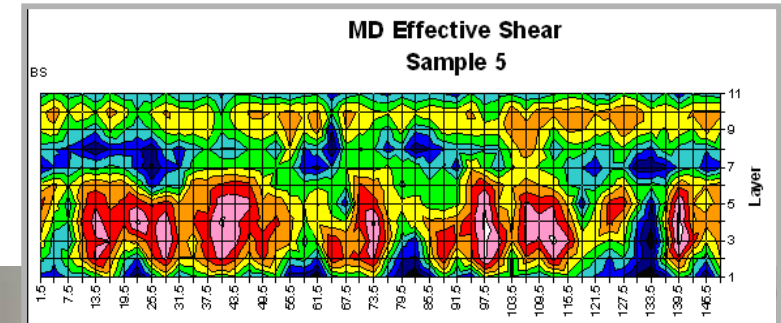
For paper machine and automation suppliers



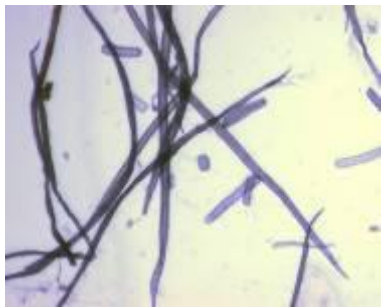
- Development of unit processes for paper making
- Fibre suspension flows – from lab scale up to mill scale unit processes
- Wet web rheology
- Raw material interactions and impacts to final products
- Side stream handling and control in pulp and paper industry
- Development of research tools and special measurements

SUPPORTING INFRASTRUCTURE

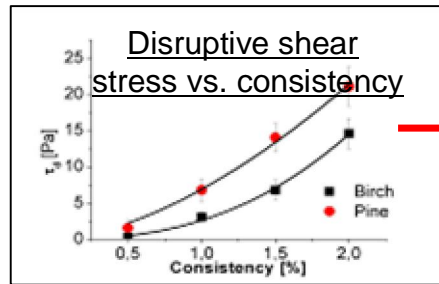
- Unique set of experimental facilities from laboratory to pilot scale
- Development of new technologies from fibre scale phenomena into realistic process conditions



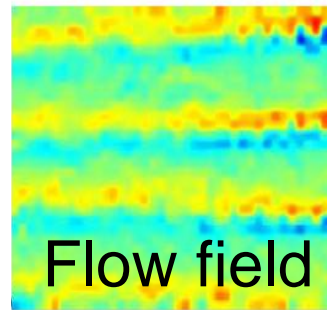
FROM RAW-MATERIAL TO PRODUCT PROPERTIES



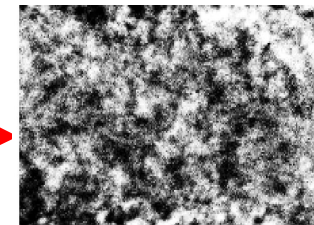
Fibre properties



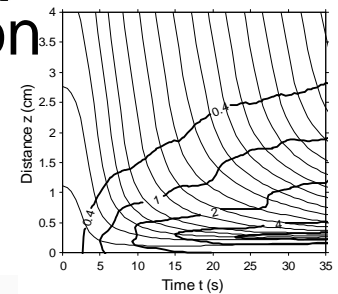
Material characteristics



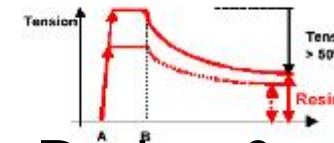
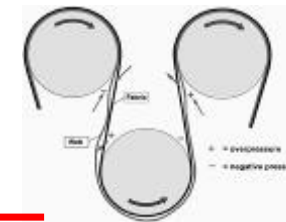
Flow field



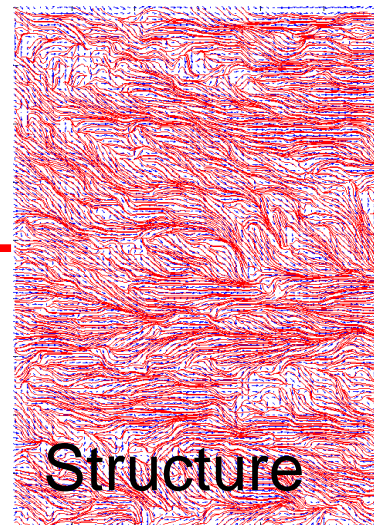
Flocculation



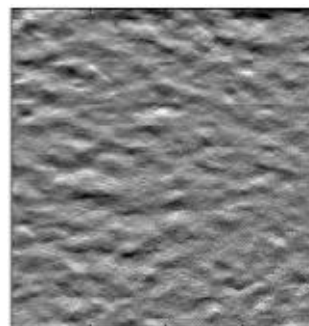
Dewatering Pressing



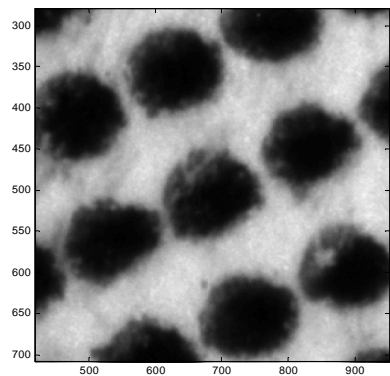
Drying & Runnability



Structure



Product properties



Print quality

BUSINESS INSIGHT

- Around 50% (3 Meur) direct customer revenues annually mainly from the top forest industry companies on global market
- Over 30 inventions transferred to industry (1995 – 2007)
- Research results utilized in commercialised applications: new headbox generations, impingement drying concept and novel measurement techniques
- Customers such as Metso Paper, Larox, UPM, Stora Enso, Kemira, Ciba



Metso Paper: OPTIDRY2: DIRECT AIR IMPINGEMENT DRYING OF PAPER



- OptiDry Vertical is Metso Paper's new impingement drying concept
- In new machine it is possible to shorten the dryer section length app. half the length of conventional dryer
- The first OptiDry unit started on Nordland Papier PM 1 in Germany, 1999
- Advantages of the method:
- Drying efficiency 3 - 4 greater than a cylinder dryer
- More rapid control of the drying section
- Suitable for all paper and board grades

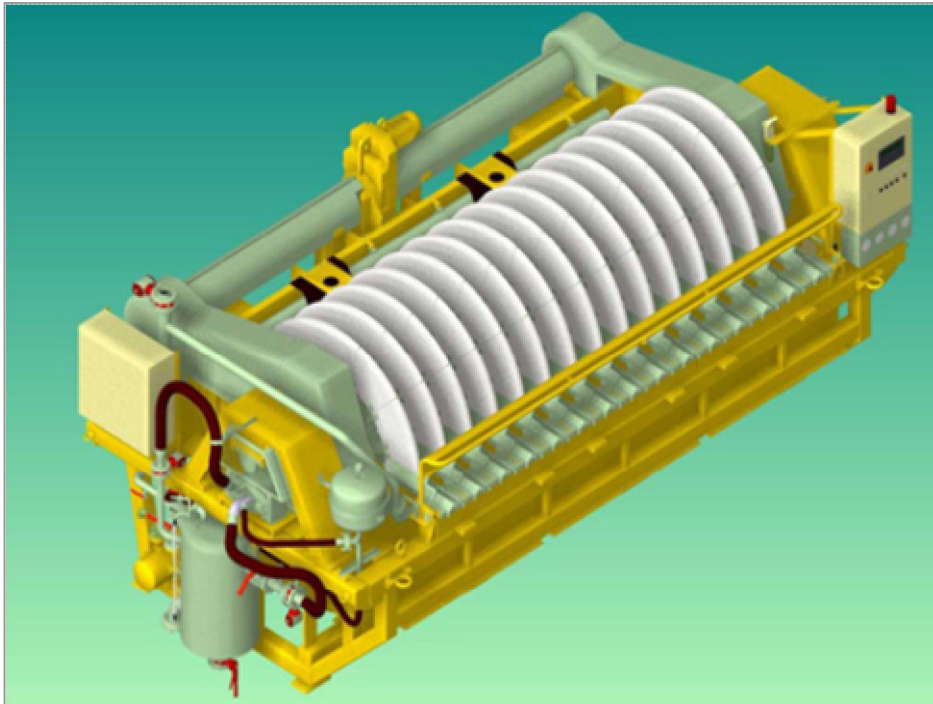
Metso Paper: PREMIUM HEADBOX FOR GAP FORMER APPLICATIONS

Benefits



- Elevates paper quality standards to a totally new level
- Very high production capacity and speed potential
- Gives outstanding structural uniformity to paper, which means uniform basis weight and fibre orientation profiles
- Fully homogenized flow free of disturbances thanks to optimized hydraulics
- Very high operating efficiency thanks to a supremely robust process also under varying production conditions
- Versatile profiling tools and a very wide operating window
- Reliable and easy to operate and maintain

LAROX'S CERAMEC® DISC FILTERS – a Novel ultrasonic cleaning technique



- Frequent cleaning with short intervals leads to high average capacity
- Less or no need of acid cleaning
- Maintenance easy
- Possible to install into existing filters
- Fully automatic operation

CONTACT INFORMATION

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VTT creates business from technology

