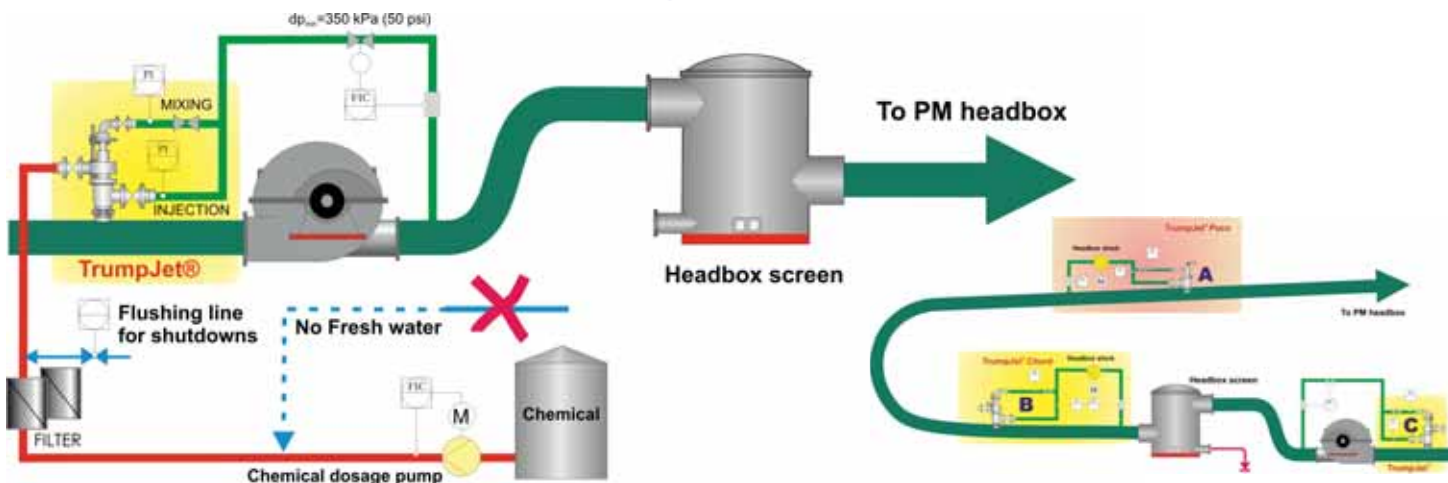


A, B and C of Mixing Concept Good results in mixing of Starch and Filler



Wetend has supplied 14 starch and filler TrumpJet systems for paper and board mills during the last 12 months. The system includes a new C-mixing station that operates together with retention aid mixing stations A+B. The results have been cost savings in starch and retention aid consumption, improved filler retention with a potential to increase filler in sheet as well. Total efficiency and system cleanliness has improved.

A, B and C of mixing – three TrumpJet Flash Mixing stations in the wet end at the heart of papermaking process. Three TrumpJet Flash Mixing stations located from headbox feed pump area to machine floor next to headbox is a sustainable mixing process that introduces and flash mixes most important wet end additives efficiently into headbox feed stock – the closest ones only seconds away from the papermachine.

- **Mixing station A:** for nanoparticle, silica or bentonite with APAM or micropolymer
- **Mixing station B:** for CPAM or retention starch with ASA or AKD
- **Mixing station C:** for strength or retention starch with fresh filler (GCC, PCC, china clay, chalk etc..)

The A, B and C concept is results of development work made together with paper mills, chemical suppliers, university scientists and Wetend

specialists.

The most important results are:

- complete elimination of fresh water or filtrate = no water, remarkable energy saving with carbon dioxide reduction
- considerable additive savings from 10 to 50%
- closeness to the headbox minimizes additive circulation in the process. This zeros operational differences in various running conditions and improves system cleanliness
- sustainable concept: lean – green – clean
- end result: low cost paper and paper production

Future potential and opportunities:

Wetend is in process to develop the concept further even for more aggressive and effective chemicals and additives. This is to improve e.g. retention, sizing and to open opportunities for a new development to use new materials and additives for radically more competitive sheet structure.

Fresh water saving offers remarkable energy saving potential - especially in winter

In the patented TrumpJet Flash Mixing System, fresh water is eliminated in chemical mixing process by replacing the water with headbox feed stock or white water or with solids containing filtrate or with thick stock or even with sludge. Following this the TrumpJet installations – in total more than 330 mixing stations – save today about 42 mill m³ of water and that saves about 1,6 mill MWh energy and approx more than one million ton of carbon dioxide.

Based on the TrumpJet process concept a new simple and straight forward energy saving method was developed by Wetend at early 2003 for paper and board mills. When the dilution water is completely eliminated there is no more need to use energy to heat up the water to elevate it to process temperature (normally 40...65°C). The method relieved the remarkable energy saving potential hidden into relatively small water flows. The first saving and investment calculations with the concept were made for an USA based SC-paper machine at 2004. The concept has now been widely approved and adapted world wide.

Wetend has further improved tools for the method: In the Northern regions of the world (Scandinavia, Central Europe, Russia, China territories, Japan, Canada, Mid and Northern United States) along with colder winter weather raw fresh water gets very cold for several months. This water temperature information is exploited in process engineering for the mill energy saving balance.

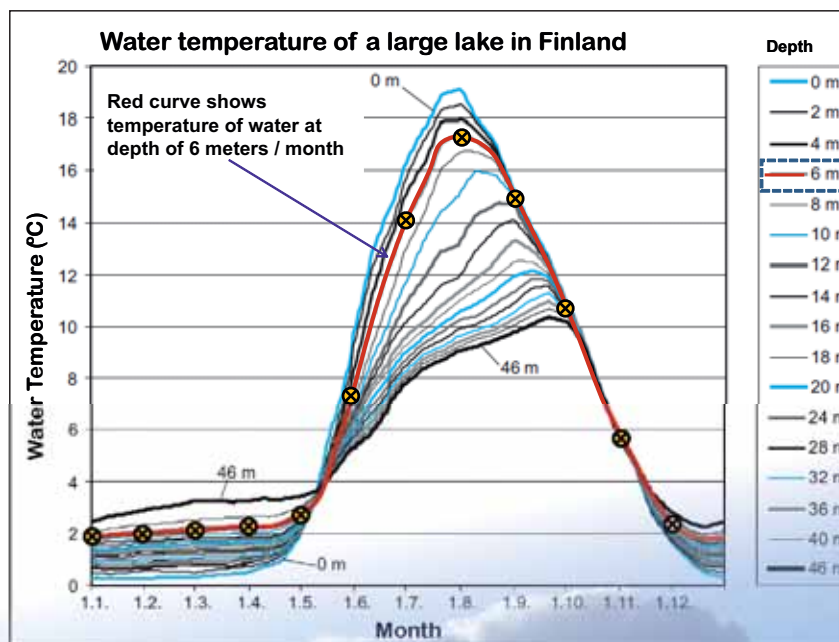
Case Example 1:

USA mill with four paper machines: The difference of energy saving gained with TrumpJet technology between summer and winter season is converted by simulation to a difference of steam production of the mill power plant:

At the warmest summer month steam is produced for heating 2,0 ton/h, at the coldest winter month 13,8 tn/h. Average steam production increase is 4,15 ton/h through the year. The annual saving due to the fresh water elimination is 430.000 EUR as energy cost.

Case example 2:

A fine paper mill: Results from a case study for a fine paper production line with fresh water saving 453.600 m³/a at process white water temperature of 45 °C:



- Results when only estimated general water surface temperature 18 °C is used:
 - Annual energy saving: 16.700 MWh = 1990 kW installed for heating.
 - Annual saving in cost of water and energy: 498.000 EUR
- Results when seasonal variation of fresh water temperature is included (water temperature month per month: from 3°C to 18°C)
 - Annual energy saving: 23.700 MWh = 2.820 kW installed for heating
 - Annual saving in water and energy cost: 880.000 EUR

The calculations shows that by taking the accurate temperature information into account the saving and investment potential increases by 42%.

Wetend has developed an easy to use program to calculate and estimate fresh water, energy, carbon dioxide and chemical savings to determine cost saving potential and payback time of TrumpJet installations. General payback time for TrumpJet installations varies from a few weeks to 14 months averaging to a range of 5...8 months.

Please ask the calculation tool from Wetend. We also gladly assist on estimating cost saving potential.

For more information: www.wetend.com

News from CEO's desk



Ten years of Pioneering Technology for Papermakers

Wetend Technologies has reached a mile stone of ten years as a company. Everything started with a close cooperation with close customers – a paper mill and a board mill. Since then the way to operate has been the guideline for many new successful technology ventures and for steadily growing worldwide business. During the time we have introduced e.g. TrumpJet Flash Mixing Technology for the industry with numerous features.

We have consistently worked on bringing new technology and new value to our customers. Basic thing from the beginning has been combining mechanical construction and process engineering to process chemistry. Wetend has set business objects to improve paper making chemistry with mechanical means. By questioning present traditional solutions Wetend has been able to develop new pioneering technologies and new, even surprising, solutions that clearly have changed the way of thinking how to run the wet end process.

The newest development result origins from a consistent work Wetend has been actively doing together with UPM in Finland for several years. It is In-Line PCC™ Filler Fiber Composite process. A new in-line calcium carbonate crystallization process is in progress to reach commercial value within 12 months. All attractive results have been made possible not only by the efforts of Wetend teams, but very important has been the input of our close customers, cooperative and talented additive suppliers and member companies, universities, scientists and experts of Wetend networks.

The new technologies of Wetend have been patent protected with several pioneer patents internationally. We have seen some efforts to copy our concepts and patent protected technology. This –even though it might be illegal– could be considered to be kind of a measure and acceptance of success of the development work done. However, the only true measurement of technology and success is valued by our customers by purchase orders. Wetend Technologies Ltd has been rewarded during past years with orders to supply more than 330 installations with total about 1200 TrumpJet mixers into 21 countries worldwide. As a result the mills have been able to save costs, environment and improve profits.

I personally, and everyone from Wetend personnel, warmly thank our customers for the continuous support we have enjoyed during the past ten year period. Business is like a train, it does not stop for long at stations, but pushes forward on time – Wetend drive is similar, we trust that during the coming years there will be many new successful ventures and prospects for continuous development and radical improvements for benefit of the industry and for the company.

Jouni Matula, CEO



The closer the better –the best use of retention aid additives



Above: Newsprint & directory paper production line: Two TrumpJet mixing stations installed on the 800 mm process pipe between the screen and head box.



Traditionally retention aid additives are inserted into the papermaking process before or immediately after the headbox screen or even before headbox feed pump.

Wetend has systematically worked to develop TrumpJet Flash Mixing technology that makes it possible to inject and mix all retention aid additives into the process between the screen and headbox feed manifold – even retention aid system with 2...3 chemical component. To be successful, mixing must be fast and thorough. Benefits will be low additive consumption and easiness to run and adjust production. Lower additive consumption leads often also e.g. to improved formation and better profiles.

Mill case example:

A newsprint and directory paper making line in Finland installed the concept for a cationic retention aid polymer (CPAM) and a new anionic micro polymer (APAM).

Primary objective was to reduce additive consumption and simultaneously increase filler retention and to eliminate fresh water consumption at the application.

The system required two TrumpJet mixing stations and they were located (1) in the basement well after the screen and (2) on the machine floor close to the headbox feed manifold.

Results:

- CPAM consumption saving 30%
- APAM saving 50% with filler retention increase of 10..15% units
- Use of fresh water was completely eliminated and injection was made with circulated headbox feed stock.

Below: Two successful examples of mixing stations installed on the machine floor just prior to the headbox feed manifold

Below left: SC line with TrumpJet for cationic polymer.

Below right: Newsprint line with TrumpJet Poco for micropolymer



In-Line PCC™ – new filler fiber fibril composite from Wetend

TrumpJet Flash Mixing Technology streamlines papermaking process.

Wetend Technologies has consistently focused and committed on development of new and innovative paper and board making wet end solutions. The newest development is In-Line PCC concept. It is a new filler fiber fibril composite material that will be produced at a paper mill directly into the production process of paper. The development has been made during several years of work.

Production of In-Line PCC will be made inside a papermaking process



– in-line. The concept exploits technologies and new innovations developed by Wetend Technologies together with associated parties. Calcium carbonate crystals are produced directly into stock at later stage of the process and the crystals will be loaded and fixed strongly on surfaces of fiber and fibrils and fines forming a composite structure.

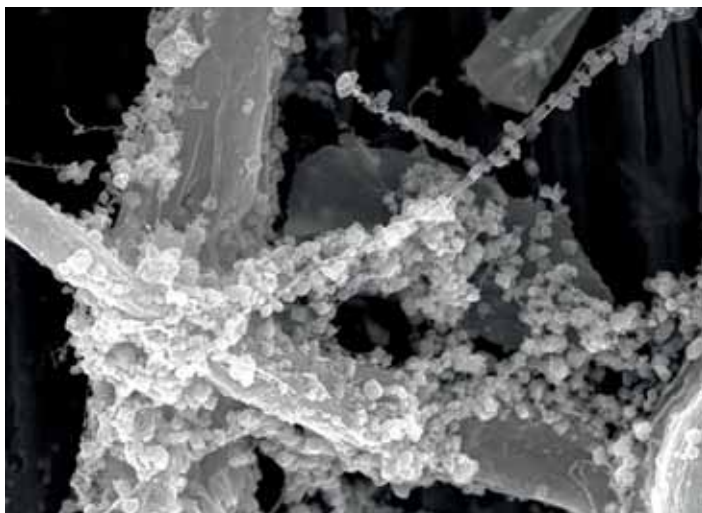
This offers several advantages: excellent retention, good web and paper properties, uniform filler distribution across the sheet, good light scattering, opacity and brightness. Good strength properties of sheet also will open more avenues to increase filler content of paper.

The In-Line PCC composite opens sheet structure of paper and ease dewatering. This cuts costs in dewatering and drying. The more open sheet structure gives also opportunities to adjust and control bulk. Costs and economics look very competitive.

The technology is protected with several patent applications. When commercialized, the In-Line PCC process will bring several new attractive tools for a papermaker to develop independently the paper product, papermaking production, raw materials and logistics and cost competitiveness with a new striking manner.

Left: In-Line PCC project team: (left) Olavi Impola (Wetend), Esko Kukkamäki (UPM), Päivi Solismaa (UPM), Jouni Matula (Wetend), Karri Tahkola, (Wetend).

Below: Calcium carbonate crystals are produced into stock and they will be loaded strongly on surfaces of fiber and fibrils and fines.



Wetend to strengthen Sales Network

Wetend Technologies Ltd has engaged new sales representatives in Australia, The Netherlands and Taiwan.

Australia

UJL Pty Ltd, Mr. Urpo Launonen
urpolaunonen@iprimus.com.au
ujl@optusnet.com.au

The Netherlands

XTECX, Mr. Henk Stals
info@xtexcx.nl

Taiwan

Tech-One Co., Ltd, Mr. Chiang Yung Tsun
techone.tw@msa.hinet.net

These arrangements will strengthen Wetend's presence and TrumpJet services in the areas. Please see our webpage www.wetend.com for further contact information.



Wetend Sales team at Wetend Sales Meeting in January 2011, Savonlinna, Finland.

FiberLaboratory has focus on mixing



The director of the FiberLaboratory Lis. Tech. Tapio Tirri

FiberLaboratory is a research organization with state of the art laboratory and industrial level process pilot facilities. Operation is organized by Mikkeli University of Applied Sciences and Lappeenranta University of Technology. The director of the FiberLaboratory

Lis. Tech. Tapio Tirri stresses that research activity will focus on selected new key areas of paper and pulp technologies.

One of the most important areas is mixing technology. Mixing dominates often chemistry and many of the process applications of the industry. Wetend Technologies supports actively the scientific mixing ventures of FiberLaboratory in singular and joint venture projects.

TrumpettiRastit –Wetend Orienteering Competition 10th of September, 2011

Wetend Technologies organizes TrumpettiRastit Orienteering Competition for Paper and Board manufacturers and its network. Competition will take place in Savonlinna, Finland on 10th September 2011. Please see www.wetend.com for further information. Look forward to meet you in Savonlinna!



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