WETENDNEWS
FOR PAPER AND BOARD MANUFACTURERS AND ASSOCIATED ORGANIZATIONS

ISSUE 2013 EN

In-Line PCC™ process installed on a Fine Paper production line

A fine paper production line 1000 tn/d in Finland installed In-Line PCC™ production system supplied by Wetend Technologies Ltd. The process was started up a year ago to produce precipitated calcium carbonate (PCC) loaded directly on papermaking stock thus generating a filler-fiber-fibril composite.

The In-Line PCC™ process is a completely new production method consisting of TrumpJet Flash Mixing Reactor installed into PM approach flow system, lime slaking, cleaning process, carbon dioxide storage and dosing system.

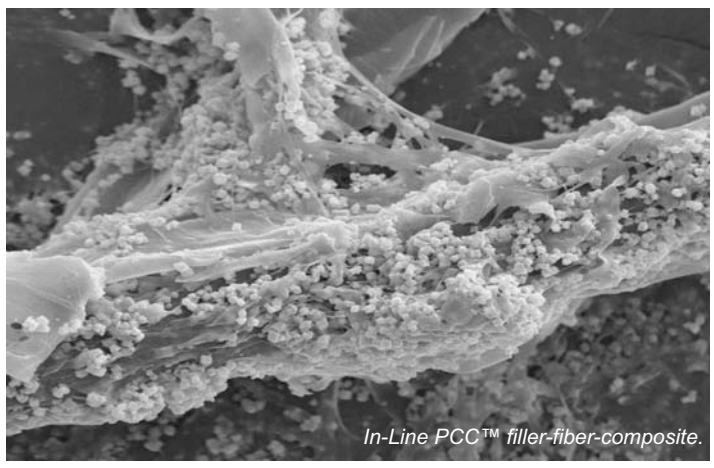
The In-Line PCC™ technology is a simple and straight forward filler manufacturing process integrated directly into the main process. The key technologies are the very fast TrumpJet Flash Mixing process and Flow Through Reactor. Even filler distribution in a paper web means better formation and good paper strength properties, which also give opportunity to increase filler content in the paper or board; saving potential is significant. The concept can exploit commercial carbon dioxide recovered from fumes of boiler plant or lime kiln.

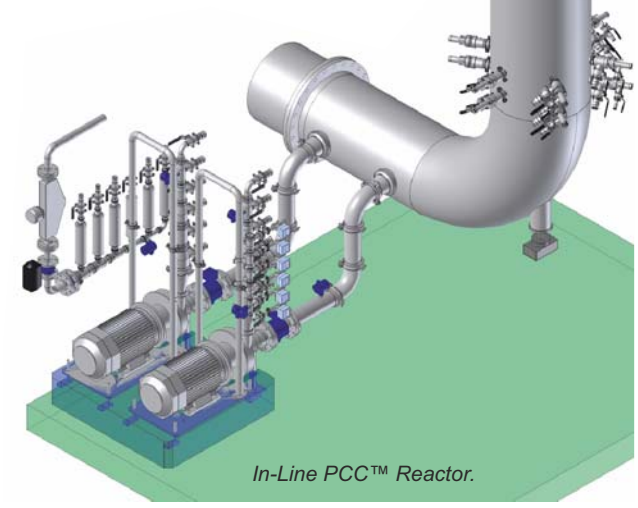
Detailed benefits of the process

The main benefit of the process are: Powerful fiber loading effect, good sheet and optical characteristics and very high retention of filler and fines. Better retention means that less filler penetrates through the wires, resulting to less wear and longer lifetime of wire fabric. Retention aid consumption can reduce *50...80%*. In addition to cost savings it means also improvement of formation.

Crystallization process binds and eliminates interfering substances resulting to a much cleaner process, reduced solids and COD of white water. The clean process improves process runnability significantly and improves efficiency of wet end additives.

The concept gives opportunity to develop quality of paper, sheet filler content and cost structure of production with a modest investment cost. In-Line PCC filler-fiber composite is a new type of filler raw material. It is competitive in quality, price and in technology. The process is protected with patents and patent applications.


In-Line PCC™ filler-fiber-composite.


In-Line PCC™ Reactor.

Cooperation of New Page Corp, Akzo Nobel and Wetend pays off at Wisconsin Rapids, USA

NewPage sustainability report 2012 (page 43): Sustainability gains delivered by thinking innovatively and working in partnership.

At NewPage, we continuously search for ways to improve the sustainability and competitiveness of our mills. Sustainability is always about optimizing costs, environmental performance and social implications, while also focusing on our customer needs and expectations.

In late 2010, our team partnered with EKA Chemicals (Akzo Nobel) to explore an entirely new mixing technology and chemistry, aiming to reduce costs and environmental impact. The Wisconsin Rapids, Wisconsin, mill saw an opportunity to improve productivity and save water and energy by making two changes on the paper machine —switching to advanced retention chemistry, followed by the installment of injection technology.

First, we switched to a proprietary fourth-generation nanoparticle (NP) colloidal silica sol and polymer-based system, yielding quality benefits, as well as steam, energy and chemical savings.

Next, a dual TrumpJet® Flash mixing system from Wetend Technologies Ltd lifted performance even higher, because rapid, intensive mixing capability allows for the nanoparticle silica sol and polyacrylamide additions to evenly disperse throughout the stock in just seconds.

These two changes were very successful and exceeded our expectations . The results are as follows:

- Achieved overall cost reduction while maintaining the quality of all grades
- Reduced energy usage annually of 50,000 MMBTU's, which correlates to a 2,750 metric ton reduction of carbon dioxide (CO_2), a greenhouse gas
- Saved 80 million gallons of water annually, which is enough water to supply 1,500 people per year
- Reduced polymer usage by 40 percent
- Reduced dosages of the new NP material by more than one-third
- Decreased wet end starch dosage while internal bond values increased
- Decreased steam consumption per unit of paper and reduced press moisture
- Improved sheet formation across all grades analyzed, while brightness and opacity showed inconsequential change. The results are a win-win for suppliers, our company and our customers, and show the power of a strong partnership and teamwork.

Source: 2012 NewPage: Making a difference, 2011-12 Sustainable Development Report, p 43.

TrumpJet installation at NewPage Wisconsin Rapids, reduces polymer usage by 40 % and saves water to supply 1500 people per year.

News from CEO's desk

Flash Mixing makes the difference and generates new pioneering technology

Wetend has developed pioneering and patented TrumpJet® Flash Mixing technology for chemicals and additives. Efficiency of additives is maximized resulting to chemical savings from 10 even to 80% depending on process application.

The singular process eliminates also the use of fresh water and cuts completely water heating energy in mixing of chemicals into the papermaking processes along with reduced CO_2 emission. The most important thing –paper and board sheet quality– develops also positively.

Flash Mixing makes the difference. This has been noticed also by chemical and additive supplies. Good cooperation between a customer, chemical supplier and Wetend can bring an additional boost for the results reducing operating costs of paper or board mill and improving sustainability. Good example of this activity is cooperation agreement developed between Akzo Nobel/EKA and Wetend as well as fluent cooperation of Wetend and Kemira.

Flash Mixing Technology of Wetend is covered and protected with more than one hundred international patents and patent applications. Wetend protected its IPR in USA and solved a patent dispute and a law suit case with EcoLab/Nalco with an agreement successfully and with satisfaction. Solving problems like this removes obstacles in communication and leaves better opportunities for operation between technology provides of different fields, like process and machinery technology and chemistry.

Wetend team works and invests remarkably in research and development. The newest pioneering development work of Wetend Technologies Ltd is In-Line PCC™ – a filler-fiber composite produced with a new surprising method from carbon dioxide and milk of lime –just seconds before headbox of paper or board machine.

Based on continuous improvement objective of Wetend is to maintain TrumpJet® Flash Mixing concept the best available technology for the industry to significantly cut operating costs and improve quality and environmental efficiency of production lines. Good, committed cooperation between all service providers and the customer is the key to maximize the result to excellent outcome.

Jouni Matula
CEO

Board mills invest in New TrumpJet® Flash Mixing Technology

Additives are a very important raw material for board manufacture. They are used in wide perspective to gain necessary quality and targeted performances for the end product. The same demanding facts are valid no matter what type of board is in question. It can be liquid packaging board, folding box board, white chipboard, liner board, corrugated medium, gypsum board or any other.

TrumpJet mixing technology improves board machine cost efficiency and sustainability.

Wetend has been active with increased intensity on all board grades and with various additives like retention aids, strength and sizing agents, biocides and even with some new innovative fiber based materials.

A new containerboard production line for test liner was started up recently in Poland

The mill purchased TrumpJet Flash mixing stations for all plies, totally six TrumpJet mixing stations. A series of retention aid chemicals exploit the concept efficiently and the system built completely avoids use of fresh water in the application. Focus of the investment was on low operating costs as well as a sustainable, resource-efficient process.

The new line is a three ply board machine supplied by Voith. Capacity is more than 450.000 metric tons per year.

Three board production lines in China

A Chinese board manufacturing company has installed TrumpJet chemical mixing stations on three board making lines in 2012. Primary focus of the investment has been reduction of operating costs by eliminating use of water and saving energy and chemicals.

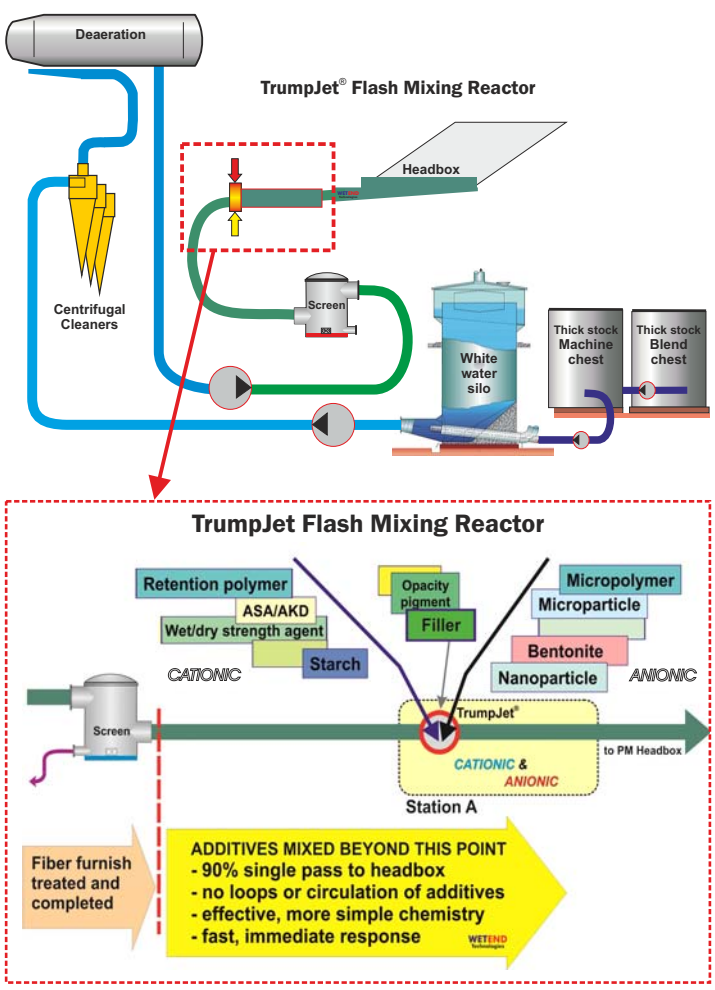
The three board making lines are in smooth operation and sustainability objectives have been met:

- water saving is 500–1000 m^3/d per mixing station
- In addition chemical saving is in the range of 30 % varying case by case depending on grade produced per each line.

New Investments to Develop Flash Mixing Reactor Technology

TrumpJet Flash Mixing Technology streamlines papermaking process.

Wetend Technologies Ltd invests with its partnering business organization network and technology partners totally several million Euro in new fast TrumpJet Flash Mixing technologies. This includes advanced Reactor concept for additives, filler and fibers with a flash type rapid mixing for additives with an objective to introduce significant improvements for paper, tissue and board mills to exploit additives with maximum efficiency in terms of quality and operating costs. Expected and targeted chemical saving rate is from 30 to 70%. The project is supported financially also by TEKES, the Finnish Funding Agency for Technology and Innovation. One of the first process concepts is In-Line PCC™ process of Wetend Technologies. Process is already in use on two paper machines.



TrumpJet Flash Mixing Reactor: mixing of several chemicals and additives "simultaneously" just before headbox.

Web Brake Eliminators from Wetend

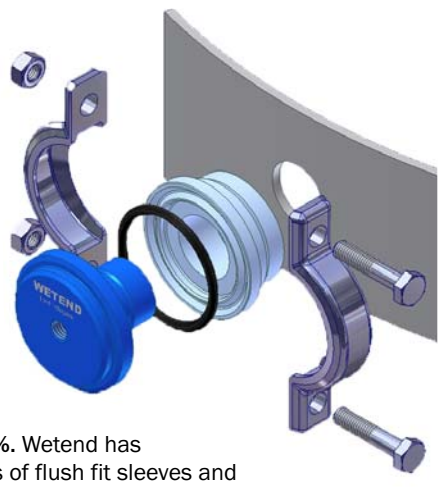
A simple way to improve sheet quality

A blind pocket of an unused small inlet or outlet connection or just a simple sampling valve can be full of old stock, dirt and biological activity. It is a probable reason for daily web breaks. Wetend Flush-fit Sleeves&Plugs can be used to remove the unused connections. It will improve cleanliness, runnability and quality.

Wetend Technologis has developed a series of flush mounted, tight, flush-fit Wetend Sleeve&Plug assemblies to remove the blind spots from the approach pipe. The final outcome is a polished, smooth, Web Break Eliminator - it eliminates the blind spots completely. If necessary, the removed connection can be taken back to the service by installing a handy WetValve into the Sleeve&Plug assembly.

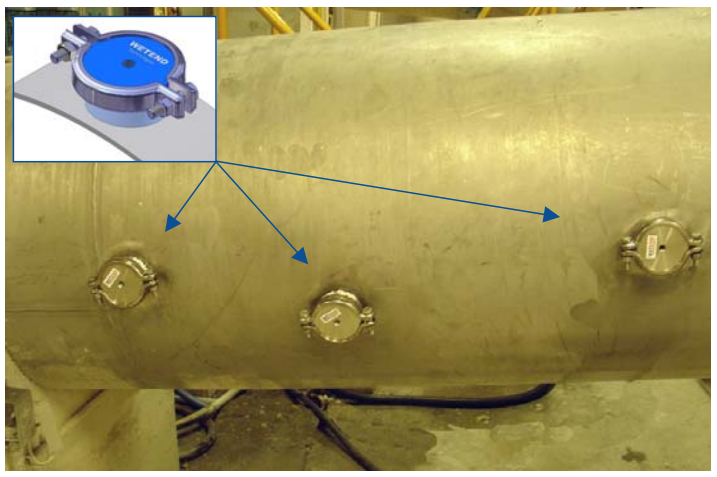
Several sizes available

The range of connections is 35–210 mm.
Material stainless steel: plug face polished to Ra 0,8 µm, by request to 0,4 µm



Mill Results

A magazine paper machine in Finland eliminated all seven old unused connections between the machine screen and headbox. **As a result number of web breaks was reduced by 50%.** Wetend has supplied close to 2000 sets of flush fit sleeves and plugs. They are used in installments to eliminate old process connections, to install new inlet or outlet valves that can be easily disconnected when needed, for TrumpJet mixer connections and stock outlet/suction connections.



Wetend's Web Break eliminators reduced sheet breaks by 50% at a magazine paper machine.

Wetend Technologies in Chicago

Prowetend Consulting was established in September 2012 to fill the growing need for customer service, sales and marketing of TrumpJet Flash Mixing systems in North America. Chicago, centralized location with excellet access to USA and Canada.

ProWetend's target is to help our customers in this demanding market situation by improving operational and cost efficiencies by solving challenges in additive and chemical additions into their papermaking processes. Several references in the USA have shown remarkable savings in chemical consumptions and improved environmental images of companies. New technology and over 30 years' experience in papermaking will help you to overcome challenges.

Olavi Goos
President, Pulp&Paper Specialist
Prowetend Consulting

Wetend to strengthen Sales Network

Wetend Technologies Ltd has engaged new sales representatives in Austria and Eastern Europe, Portugal, Russia, Spain and USA .

Austria and Eastern Europe
Flowtec Industrietechnik GmbH, Mr. Bedo COC
bedo.coc@flowtec.at

Portugal
CelPapel Equipamentos Industriais, Lda,
Mr. James Blades
james.blades @ celpapel.com

Russia
Makorus ooo., Mr. Sergey Malkov
Malkov_sy@makorus.com

Spain
BTF System S.L., Mr. Toni López
toni.lopez@btf.es

USA
ProWetend, Mr. Olavi Göös
olavi.goos@prowetend.com

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

Welcome to meet us in exhibitions and seminars in Austria, China, Germany and USA

In 2013 Wetend Technologies will be present in:

Tappi PaperCon 2013 exhibition April 28–May 1 in Atlanta, GA, USA. We are also introducing our newest technology and results at the Papermaking seminar in two presentations:

- New In–Line PCC filler–fiber composite opens opportunities for paper and board mills
- Fast flash mixing of wet end additives opens new avenues for business and for development of process chemistry

Future.Forum Paper 2013, May 15–16, in Graz, Austria. Presentation:

- Pioneering innovations challenge conventional process chemistry and efficiently cut raw material costs with sustainable results.

Welcome to meet us also in **ZellCheming 2013**, June 12–14, Wiesbaden, Germany and in **2013 China International Paper Technology Exhibition**, Beijing, 23–25 September.

Looking forward to meeting you!

WETEND Technologies

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