TrumpJet® Chemical Flash Mixing Technology of Wetend Technologies

**FOR IMPROVED EFFICIENCY AND SUSTAINABILITY**

Proven Technology: 450 Mixing Stations sold!

www.wetend.com
Wetend Technologies Ltd

- Wetend Technologies Ltd is the global technology leader in mixing of additives to process streams.

- The main products are TrumpJet® Chemical Mixers that inject and flash mix additives and chemicals efficiently in very sustainable manner.

- Private owned company is founded in 2001.

- Located in Savonlinna, Finland. Own sales organization also in Peking, China.
• TrumpJet® installations supplied are saving approximately 65 million m³ of fresh water annually

• The energy saving at the mills is total more than 3.2 Million Mwh every year

• There is an annual reduction potential for over 2 Million tons of CO₂ emission
Benefits of TrumpJet Flash Mixing
− True CLEANTECH − Improved runnability, economics and sustainability

1. Reduces chemical consumption by 20...60%
   Fast, effective mixing just before headbox, maximizes efficiency of chemicals

2. Reduces use of fresh water in chemical dilution by 100%
   Clean headbox feed stock as circulated injection media

3. Less energy needed
   No fresh water to be heated for dilution

4. Improves paper and board quality
   More uniform sheet structure, formation and profiles. Cleaner process, less breaks
TrumpJet® Flash Mixing Reactor

NEW TECHNOLOGY FOR MIXING ADDITIVES IN SUSTAINABLE MANNER
TrumpJet® Flash Mixing process – water saving 100%
Chemical saving 20…40% or even more

• TrumpJet mixing technology is used for sustainable but highly effective, fast and thorough mixing of papermaking chemicals

• Technology requires no water for dilution
  – Enables 100% water saving in chemical mixing

• Fast mixing enables dosing chemicals in optimal location just before headbox
  – Chemicals remain active, dosage can be radically reduced

TrumpJet operation principle
TrumpJet improves paper quality and runnability
Homogenous distribution – Better quality, reduced chemical consumption, less production breaks

Conventional dosing methods

Flash mixing with TrumpJet

Bad/Poor dispersion, Bad/Poor distribution

Good dispersion, Good distribution
TrumpJet® Flash Mixing Reactor
Set up example for multiple chemicals & additives

- Station C
  - Strength Starch
  - AKD or ASA-sizing

- Station B
  - Retention polymer

- Station A
  - Silica or Bentonite
  - Micro-polymer
  - NCF or MFC

**PAPER OR BOARD MAKING LINE**
**Saving potential**
- Chemical savings 20…60% or higher
- Fresh water saving 100%
- Energy saving
- Excellent sheet quality and formation

→ Payback time 2…8 months
TrumpJet® Flash Mixing Reactor opens opportunities and improves resource efficiency and sustainability

**REDUCE CONSUMPTION?**

- Improved Sustainability
- Cut costs
- Sharpen quality
- Replace chemicals
- Better formation
- Improved Profiles
- Better runnability
- Improved Net efficiency
- …

**CREATE NEW! PICK UP THE OPPORTUNITY!**

- Generate composites
- Add more filler to replace fibers
- New additives and chemicals
- Gas, (O₂, CO₂, Air) micro bubbles
- Nano and micro fibers
- Improved Sustainability
- Cut costs, improve economics
- New end product characteristics
- In-Line PCC™
- Synthetic fiber
- …
New, innovative TrumpJet injection pump for high efficiency and cleanliness of process

No fiber or dirt build up – excellent runnability
- Smooth, step-free and polished hydraulic design, even for long synthetic fibers
- Low pulse design

Smart flow measurement and control

Compact & light
- Smart design with fully integrated high speed permanent magnet motor
- Install pump freely on the process area, close to the process pipe
- Quick and cost effective installation
Customer References

TrumpJet® Flash Mixing Technology

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Results

- Water saving in chemical dosing 100%
- Chemical savings
  - Starch 20%
  - CPAM 30…40%
  - APAM 30%
- Total retention unchanged
- ASA dosage unchanged
- Consumption of OBA slightly reduced
- Formation unchanged
- Tensile MD/CD slightly better or the same
- Internal bond strength the same
- CD/MD profiles unchanged
- Dewatering unchanged
- Improved operation of centrifugal cleaners
- Less good filler in rejects of cleaners

Grade Fine Paper
Wire width 7,250 mm
Desing speed 1,400 m/min
Basis weight range 40-120 g/m²
Starch and filler (GCC) mixing results with TrumpJet® Flash Mixing
A Large Fine Paper machine, China

RESULTS after installation of TrumpJet® mixing station C (A+B installed before) and starch moved from thick stock chest to mixing station C and GCC moved from pre-cleaner location to mixing station C:

- Reduced starch consumption 20%
- Reduced CPAM and APAM consumption 30…40%
- Total retention improved
- ASA dosage unchanged
- Consumption of OBA slightly reduced

- Formation unchanged
- Tensile MD/CD slightly better or the same
- Internal bond strength the same
- CD/MD profiles unchanged
- Dewatering unchanged
- Total net efficiency of the production line improved

- Improved operation of centrifugal cleaners
- Less good filler in rejects of cleaners

Use of fresh water eliminated with all three mixing stations:
- Annual water saving: 1 million m³
- Annual energy saving: 33,000 MWh
- Annual CO₂ reduction: 20,000 tons
The world largest coated WF paper production line 4000 tn/d in China

Annual objectives in energy and water savings with three TrumpJet stations

- Fresh water savings: 2,3 mill m³
- Energy savings: 77 000 MWh
- *CO₂ reduction: 44 000 tn

CO₂ emission reduction approx. 10% from the total emission load of the paper machine
Label paper machine, China
Mixing of APAM & Silica and AKD and PAE with two TrumpJet stations

Concept
• APAM and silica mixed together with TrumpJet® Chord
• AKD and PAE mixed together with TrumpJet® Poco

Results
• Consumption of chemicals:
  • Retention aid APAM 20% less
  • Retention aid Silica 20% less
  • Sizing AKD 20% less
  • Sizing PAE 20% less
• Good quality of paper and runnability of production
• Use of Fresh water or filtrate eliminated in mixing
• Payback time of the investment: 30 days
NCR specialty paper, China

A: Bentonite
B: Sizing Agent & Retention aid polymer

Results of PM1

• 50% reduction in consumption of retention additives
• 30% reduction in consumption of sizing agent (rosin)
• Fresh water eliminated 100% in additive dilutions
• Repeat order for PM2
Liquid packaging board machine, China
Sizing Agent (Rosin) & Retention aid (CPAM)

Results

• 20% reduction of consumption of CPAM and Rosin per three plies
• 10% improvement in retention
• Fresh water eliminated 100% in dilution

Three (3) plies, total six (6) TrumpJet Flash Mixing Stations
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Efficient CleanTech for Process Industry

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