



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**

**The saved water
equals to annual
water
consumption
of 2,3 Million
Chinese**



Benefits of TrumpJet Flash Mixing

– True CLEANTECH – Improved runnability, economics and sustainability

**Reduces
chemical
consumption
by 20...60%**

Fast, effective mixing
just before headbox,
maximizes efficiency
of chemicals

1

**Reduces
use of
fresh water
in chemical
dilution
by 100%**

Clean headbox
feed stock as
circulated
injection media



**Less energy
needed**

No fresh water
to be heated
for dilution

3

**Improves
paper and board
quality**

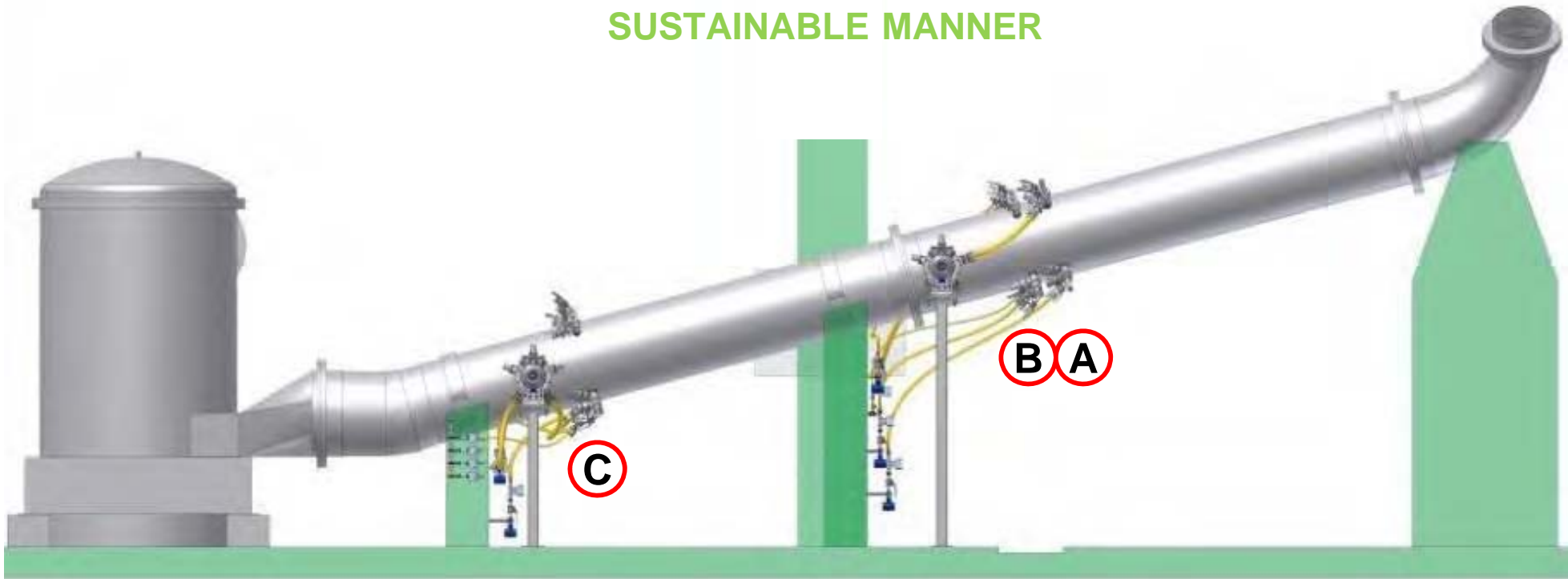
More uniform sheet
structure, formation
and profiles. Cleaner
process, less breaks

4



TrumpJet[®] Flash Mixing Reactor

NEW TECHNOLOGY FOR MIXING ADDITIVES IN
SUSTAINABLE MANNER

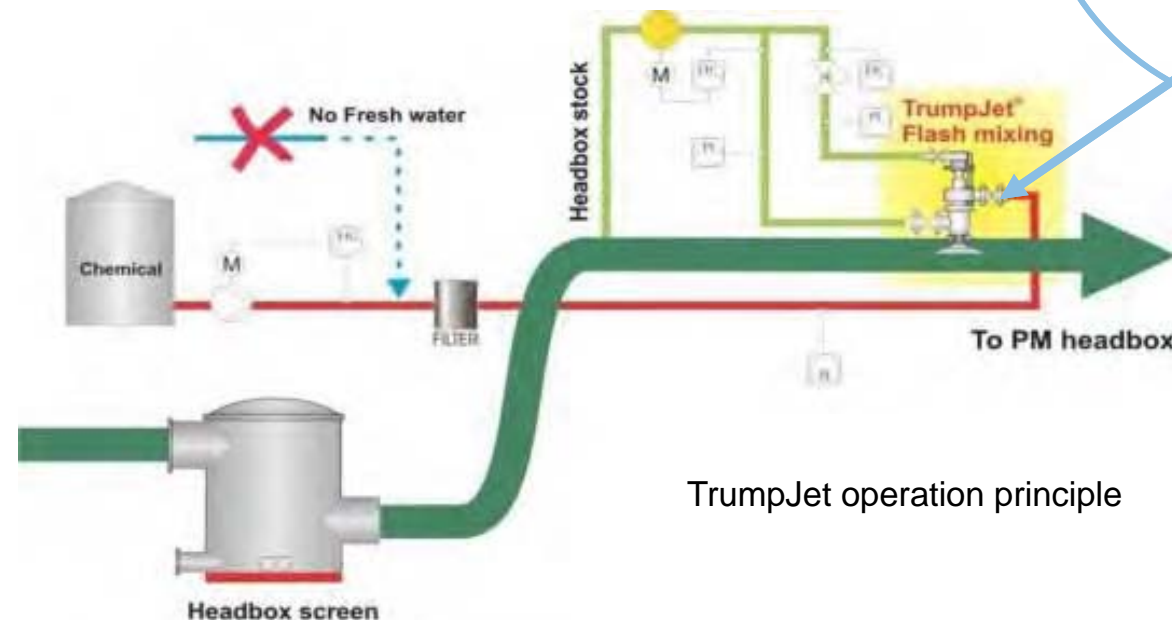
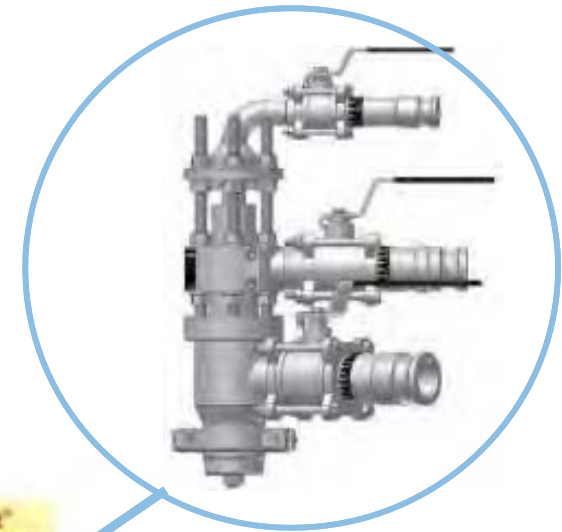




TrumpJet® Flash Mixing process – water saving 100%

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

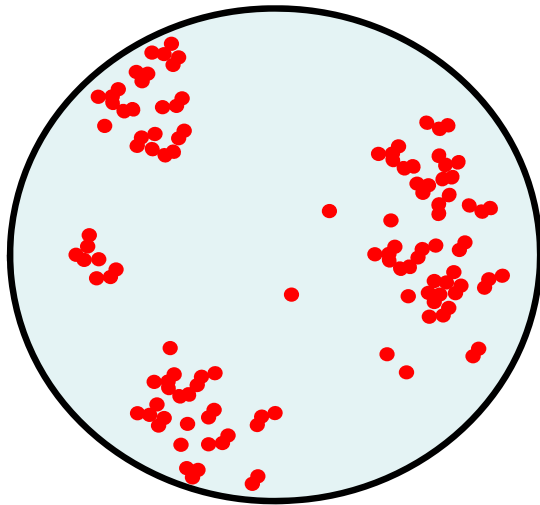




TrumpJet improves paper quality and runnability

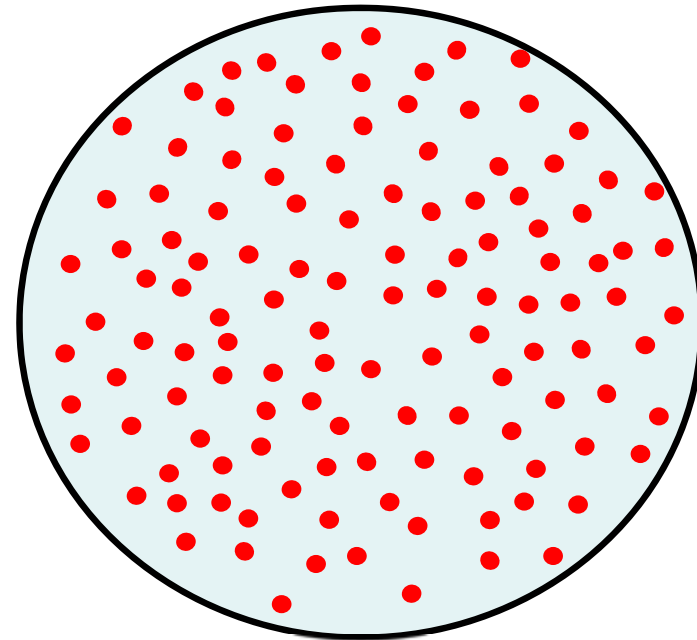
Homogenous distribution – Better quality, reduced chemical consumption, less production breaks

Conventional dosing methods



**Bad/Poor dispersion,
Bad/Poor distribution**

Flash mixing with TrumpJet

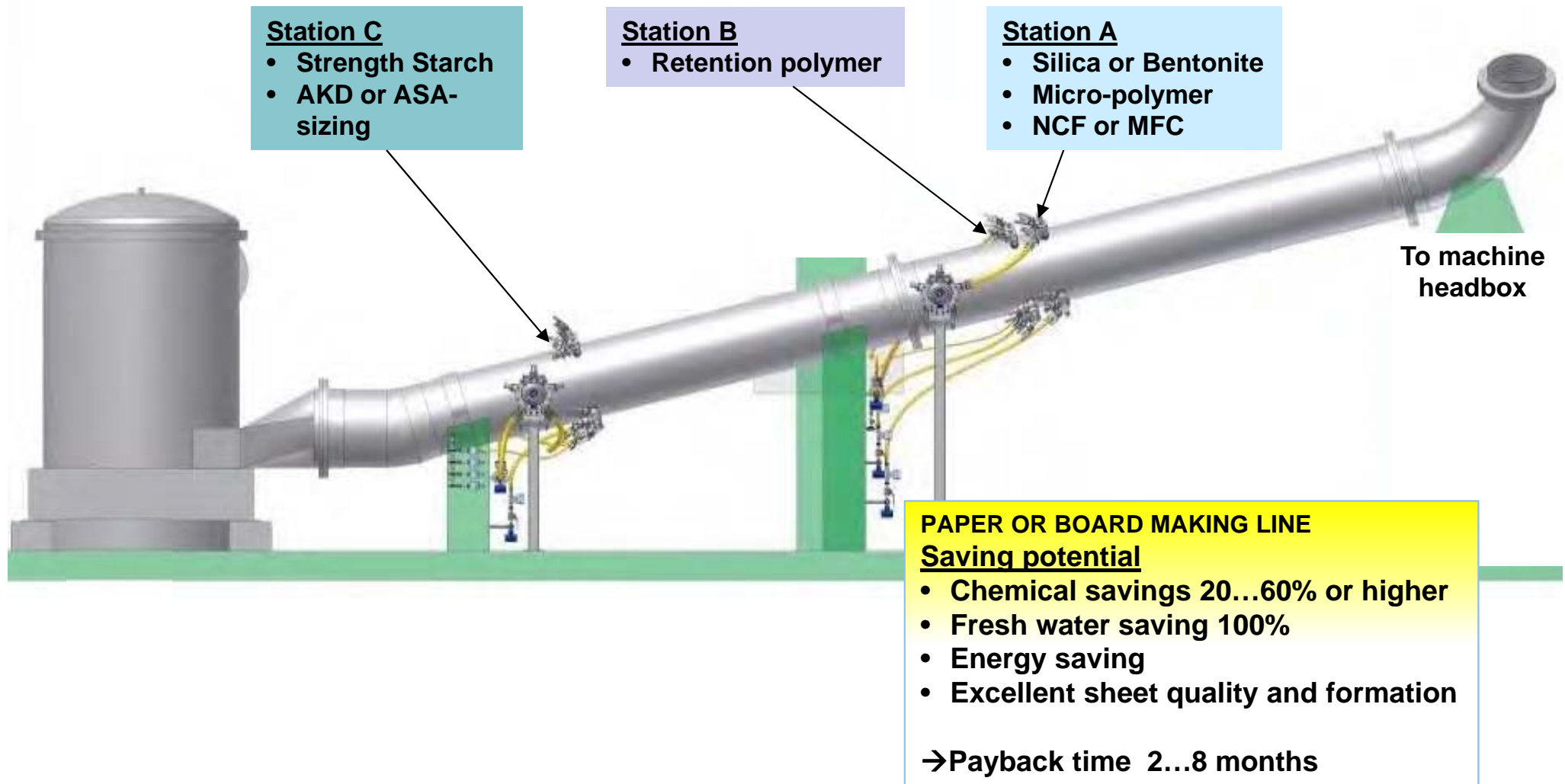


**Good dispersion,
Good distribution**



TrumpJet® Flash Mixing Reactor

Set up example for multiple chemicals & additives





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

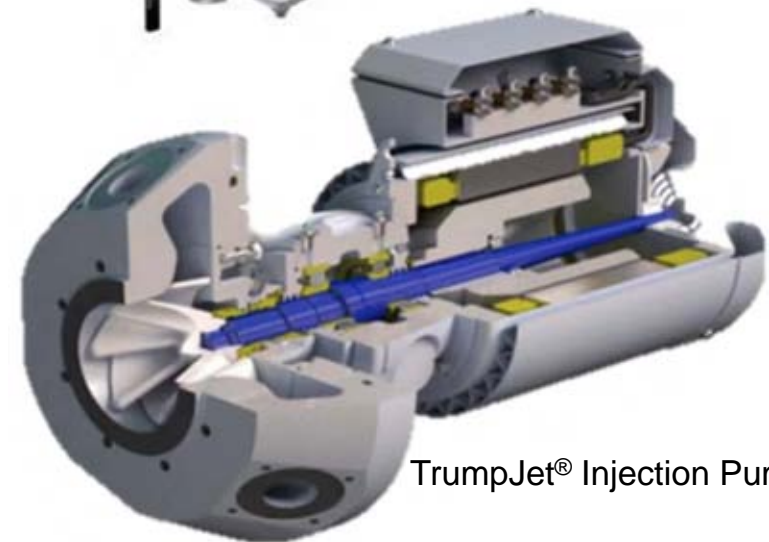
No fiber or dirt build up – excellent runnability

- 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



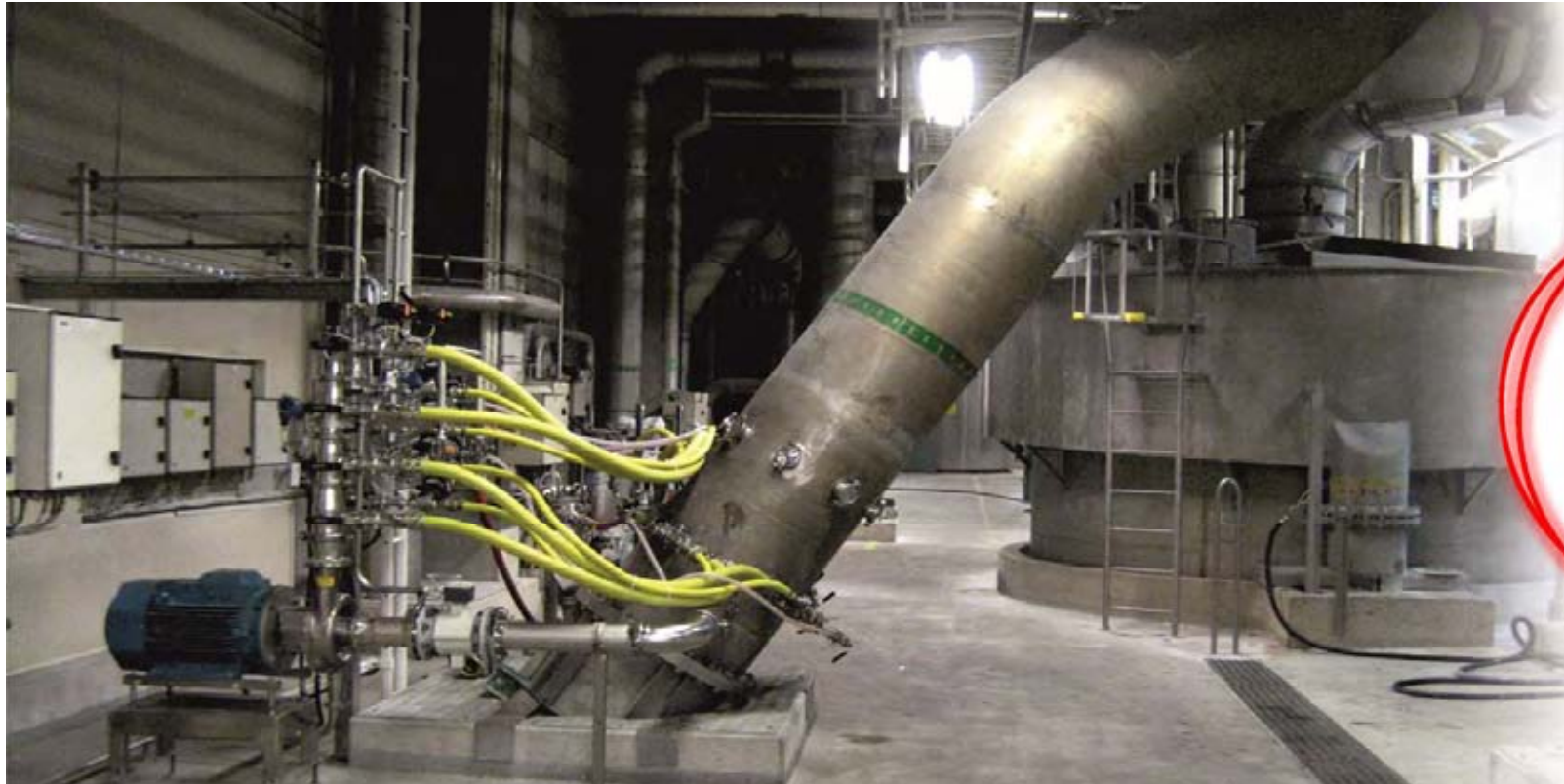
TrumpJet® Injection Pump

Patents pending by Sulzer and Wetend Technologies



Customer References

TrumpJet® Flash Mixing Technology



**Proven
Technology:
450 Mixing
Stations sold!**



20...40% reduction in chemical consumption

Case Fine Paper, China

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/m ²

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

CO₂ emission reduction approx. 10% from the total emission load of the paper machine

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



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





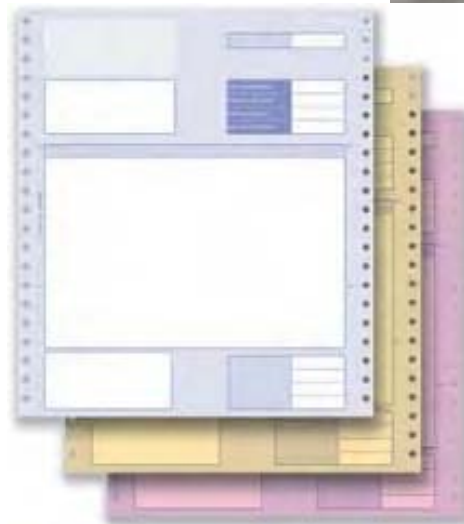
NCR specialty paper, China

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



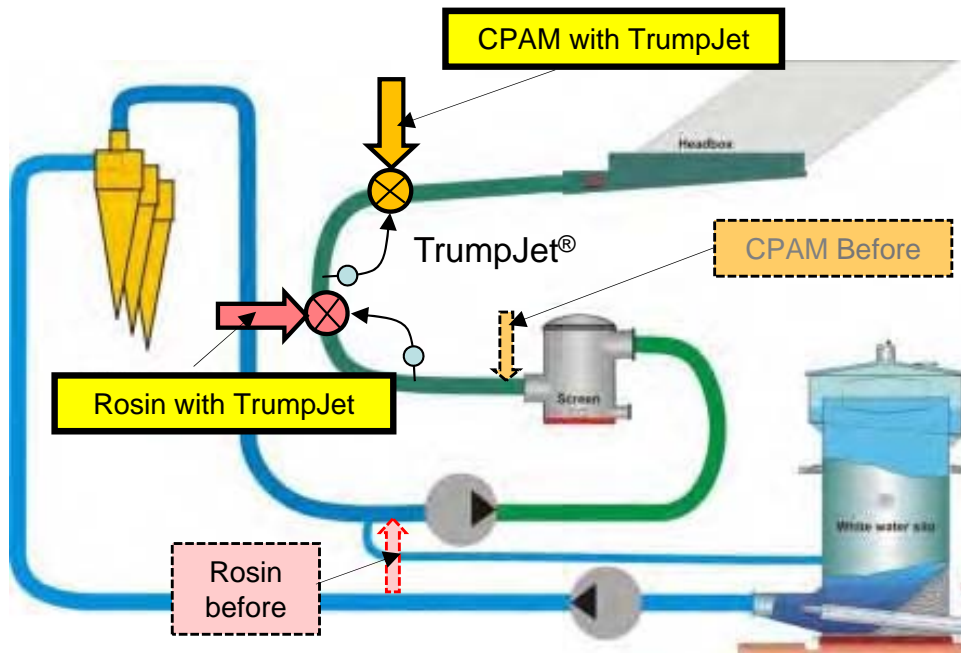


Liquid packaging board machine, China

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



TrumpJet[®] Flash Mixing Technology of Wetend Technologies

EFFICIENT CLEANTECH FOR PROCESS INDUSTRY



www.wetend.com