



KLASS FILTER

Closing of water loops and reduce fresh water consumption

with a novel class of maintenance free police filters

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Technologie Kring Paper and Board

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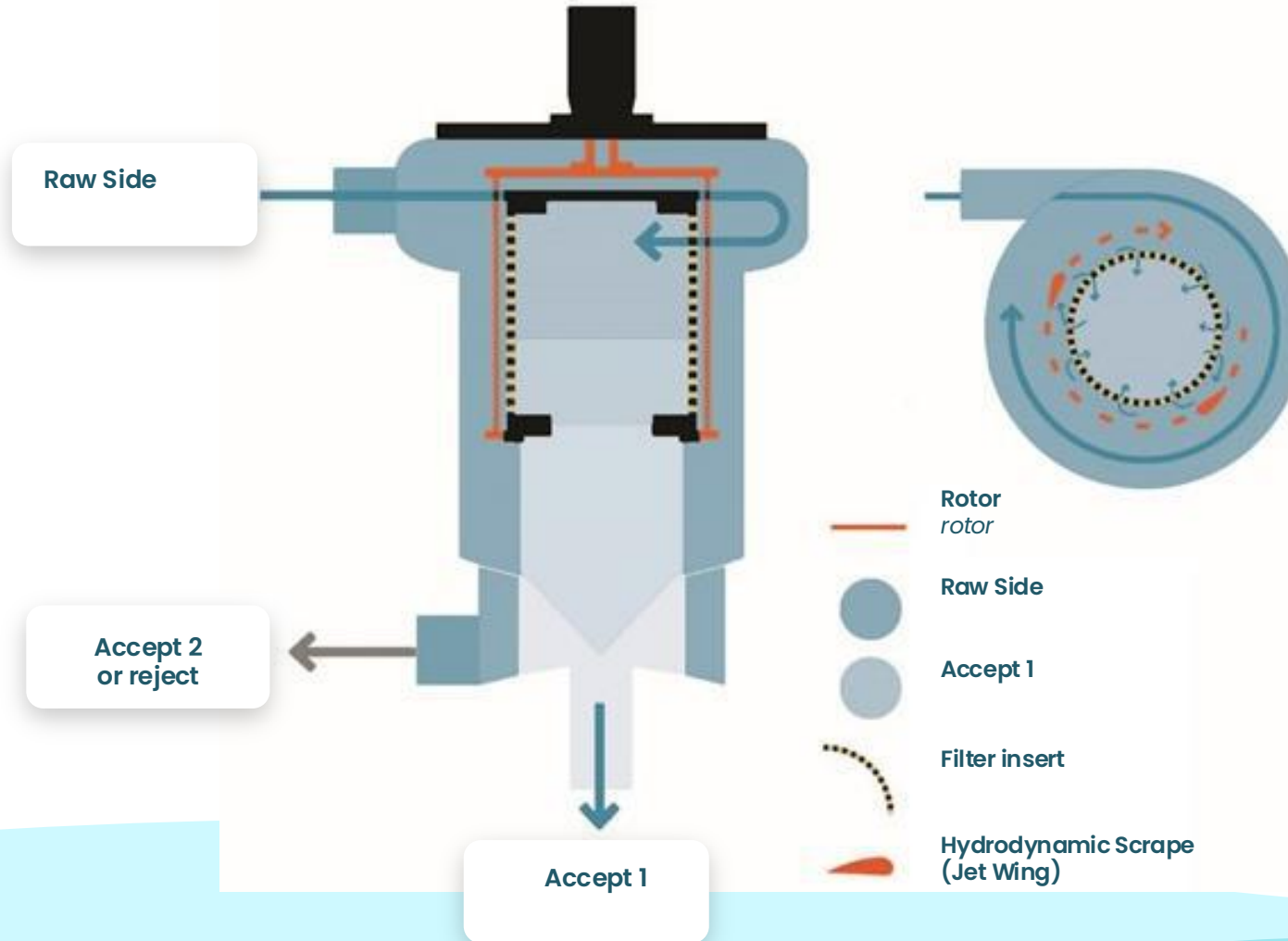
Jet Wing Liquid Filter



Jet Wing Liquid Filter



Jet Wing Liquid Filter



Input	Screen
< 5 % DS	< 100 μm < 60 μm < 25 μm

Jet Wing Liquid Filter



Key functions:

- High g-forces keep abrasive particles away from mesh, thus no wear
- High differential speed prohibits long fibres passing the mesh
- Two accept exits when used in paper industry:
 - Accept 1: no hard particles, only small particles and short fibres
 - Accept 2: hard particles, big particles, long fibres
- Self cleaning every 0.03 seconds
- Low energy consumption: 40 to 140 Wh/m³
- Mesh 100µm standard
- Mesh 60µm for special applications
- Slot 25 µm for fibre separation

Application cases



- Folding box board mill A
- Folding box board mill b
- Containerboard mill A
- Containerboard mill B
- Specialty Paper Mill

Clear filtrate vs. Klass filtrate

folding box board machine A

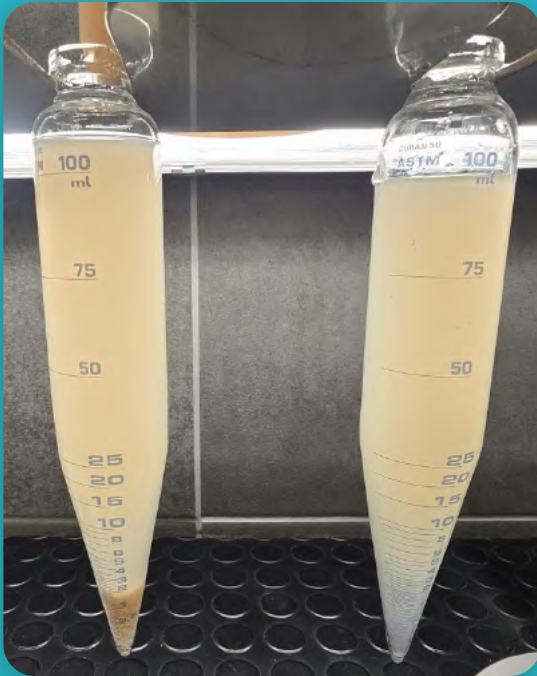


Clear filtrate vs. Klass filtrate

folding box board machine A



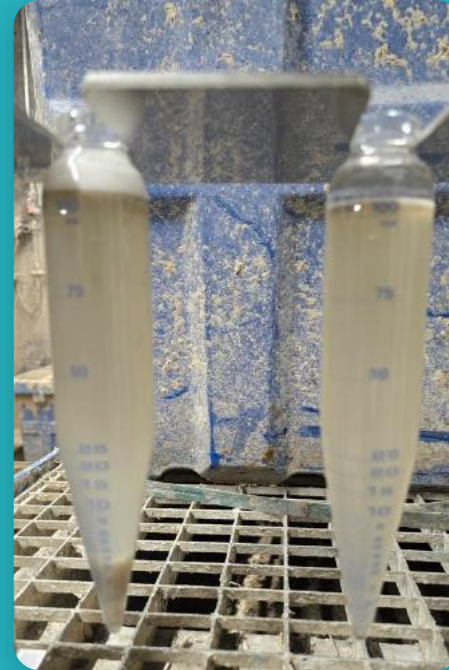
First evaluation in lab



raw side

100 μ m

Jet Wing Liquid in operation



raw side

100 μ m

Clear filtrate vs. Klass filtrate

folding box board machine A



Raw



Accept 1 at 100 μ m



Ultra clear filtrate vs. Klass filtrate

folding box board machine B



Ultra clear filtrate vs. Klass filtrate

folding box board machine B



Raw side



Accept 1 (100µm)



Ultra clear filtrate vs. Klass filtrate

container board mill A



Ultra clear filtrate vs. Klass filtrate

container board mill A



Present status:

- clarified water with a solids content of 1,878 mg/l
- In practice this can't be used, as in average press spray bars with nozzle dia. 700µm are clogged within 18 to 21 days
- Sometimes even after 2 days.
- Thus up to now fresh water was used.

Ultra clear filtrate vs. Klass filtrate

container board mill A



Evaluation trial:

- Jet Wing Liquid Filter with 100 μm filter element produces Klass Filtrate.
- Solids drop to 342 mg/l.
- reduction of 81.7% of solids.
- A 9 m spray bar fitted with all nozzles present in mill as well as nozzles desired for the future.
- After 60 days not a single nozzle with diameter of 200 μm had clogged.
- continuous self-cleaning ensures consistently stable water quality – ideal for critical applications such as wire and felt cleaning.
- Mill is now rearranging water loops to use Klass Filtrate for spray bars.
- Water reduction possible through smaller nozzle diameter.

Ultra clear filtrate vs. Klass filtrate

container board mill B

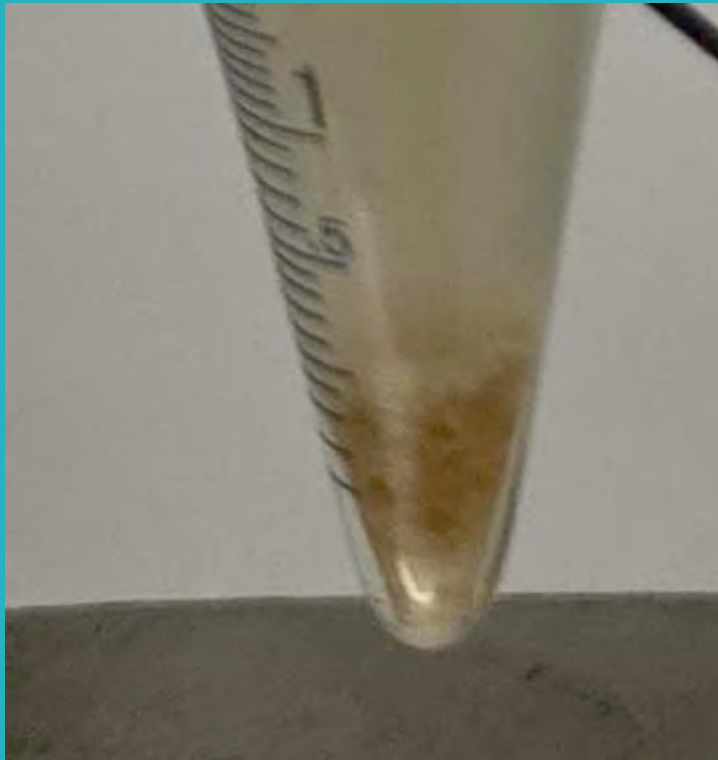


Ultra clear filtrate vs. Klass filtrate

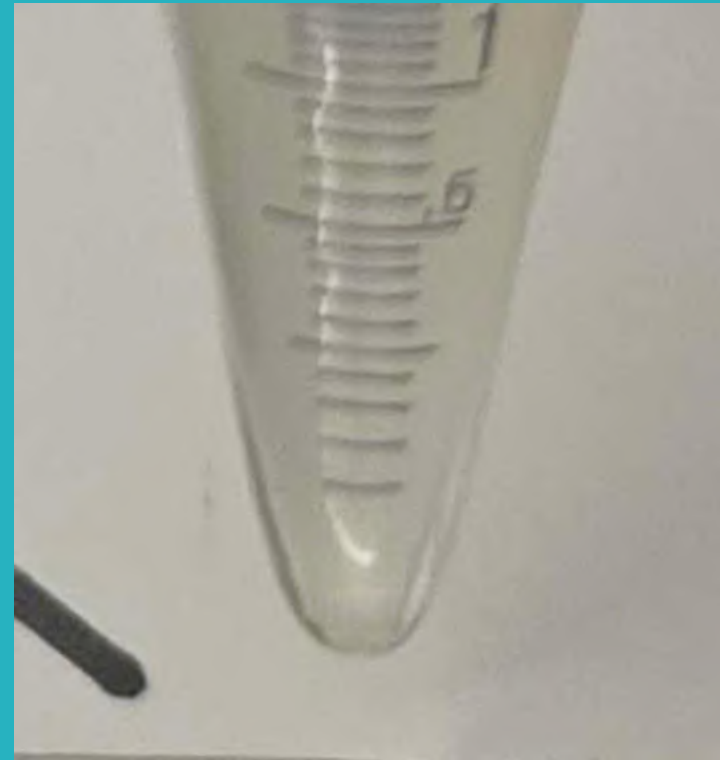
container board mill B – Sample 1



Raw side



accept

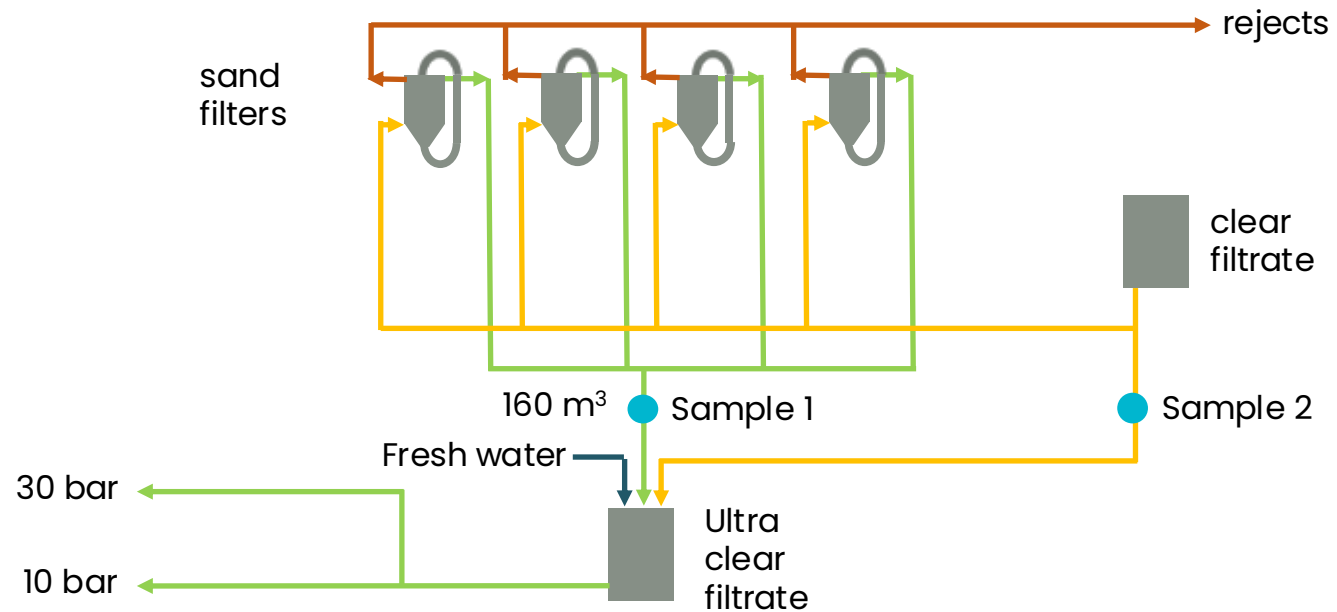


Ultra clear filtrate vs. Klass filtrate

container board mill B



Water circuit existing



Ultra clear filtrate vs. Klass filtrate

container board mill B – Sample 2



Raw side



accept

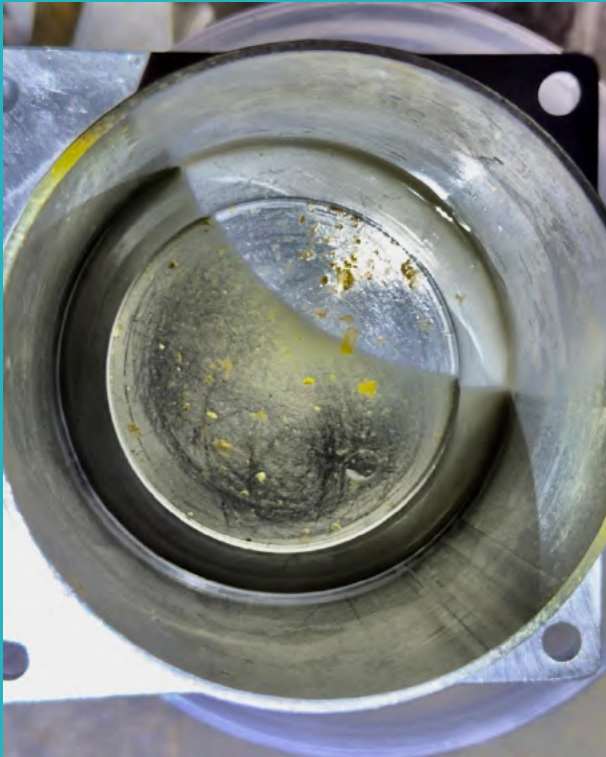


Ultra clear filtrate vs. Klass filtrate

container board mill B – Sample 2



Filter residue

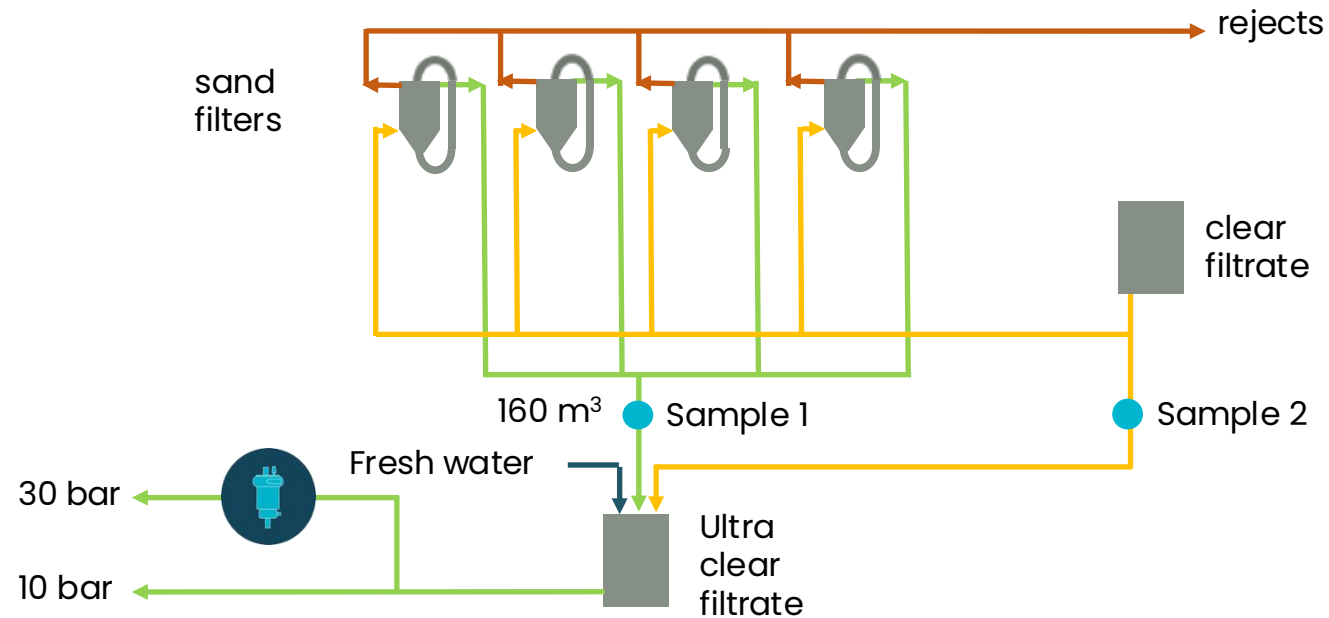


Ultra clear filtrate vs. Klass filtrate

container board mill B



Water circuit original planning

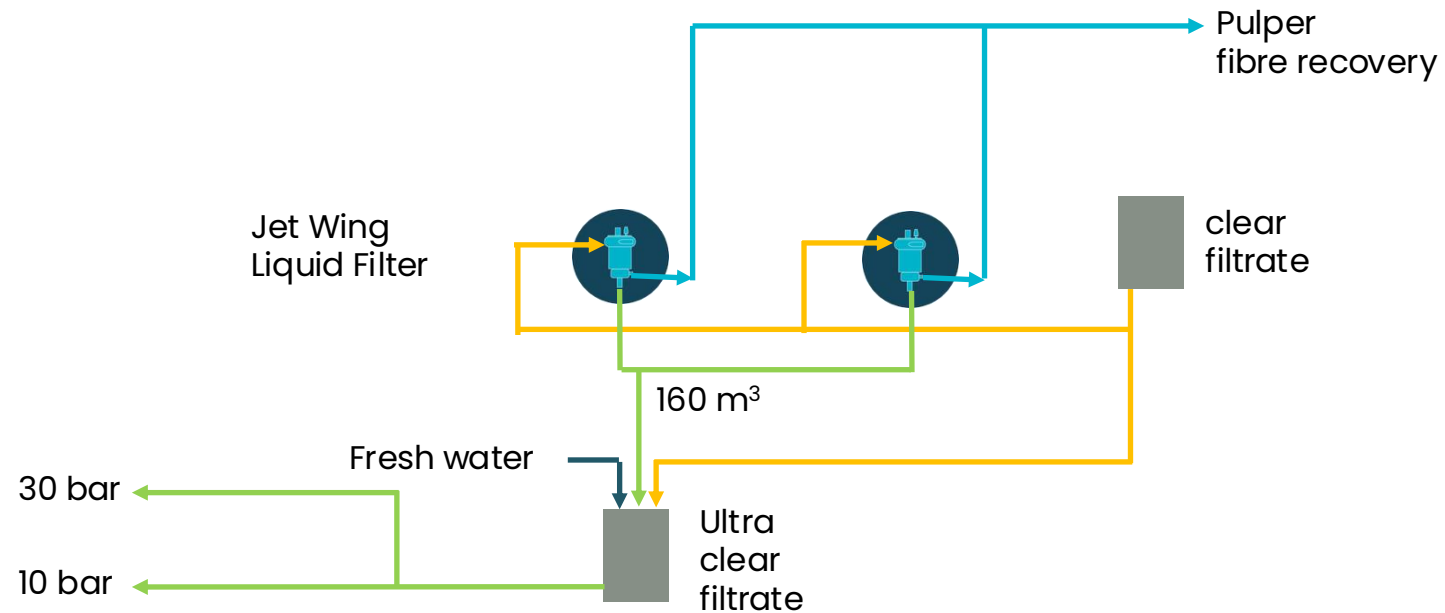


Ultra clear filtrate vs. Klass filtrate

container board mill B



Water circuit planning with fringe benefits



Ultra clear filtrate vs. Klass filtrate

container board mill B



Benefits

All waters are now Klass filtrate quality.

No more microbiological contamination of water loops.

No more fibre losses as Accept 2 contains long fibres brought back into pulper and dilution.

No more maintenance.

Accept 1 is perfectly suitable for

spray bars;

sealing water;

lubrication water.

Water savings possible through smaller nozzles on spray bars.

Ultra clear filtrate vs. Klass filtrate

specialty paper mill



Ultra clear filtrate vs. Klass filtrate

specialty paper mill



Raw side



accept



Ultra clear filtrate

specialty paper mill



Ultra clear filtrate can just be used as dilution water in pulper and before fan pump:

- Too many big particles
- Too many long fibres

clogging all nozzles

Excess is going to water treatment plant.

High COD

High loss of fibres – 150 kg per day vanishing in city sewer.

Fresh water consumption is too high, so they'll lose German and European Ecolabel in 2027.

Ultra clear filtrate

specialty paper mill



Accept 1 will be used first on nozzles on disk filter:

- No more clogging of nozzles by too big particles
- No more clogging of nozzles by long fibres
- No more wear of nozzles by hard particles

Reduction of fresh water consumption by over 40% – maintaining German and European Ecolabel.

If output of Klass Filtrate is big enough, water will be used on spray bars. In fact mill expects reducing fresh water by 60%

Accept 2 is going into the pulper:

- Keeping 150 kg of long, expensive fibres in production
- Reducing COD by at least 1/3

Summary



Summary



- The Jet Wing Liquid Filter allows using filtrate from the water loops where up to now fresh water was required
- The Jet Wing Liquid Filter does this with minimal energy
- The Jet Wing Liquid Filter does this with minimal maintenance
- Through double accepts the Jet Wing Liquid Filter generates perfect water for spray bars and similar applications. And maintains valuable fibres in production.
- Fibre recovery is made easy.
- COD can be reduced.
- Up to 50% fresh water reduction have been achieved.
- Next step: 80% reduction of fresh water.

Thanks a lot



Questions?



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