

ecowirl[®] m
paper industry



econovation[®]
the twirl behind your business

a process from the
paper industry. so far.



vortex technique in the paper industry

In the pulp and paper industry we move up to 5000 t water per hour in the primary water circuit of one production line, and 95 % of it will be reused directly. To recycle this water a slot- or hole-screening and the cyclonic separation are used in the primary circuit. The secondary circuit works with flotation and/or different filtration processes. For all other circuits, a diversity of mixing and separation techniques comes in use, depending on the requirements of the paper product. There are water and sewage treatment plants in almost every mill and the conventional vortex technique of the cyclonic separation uses water and air as medium for the separation of substances.

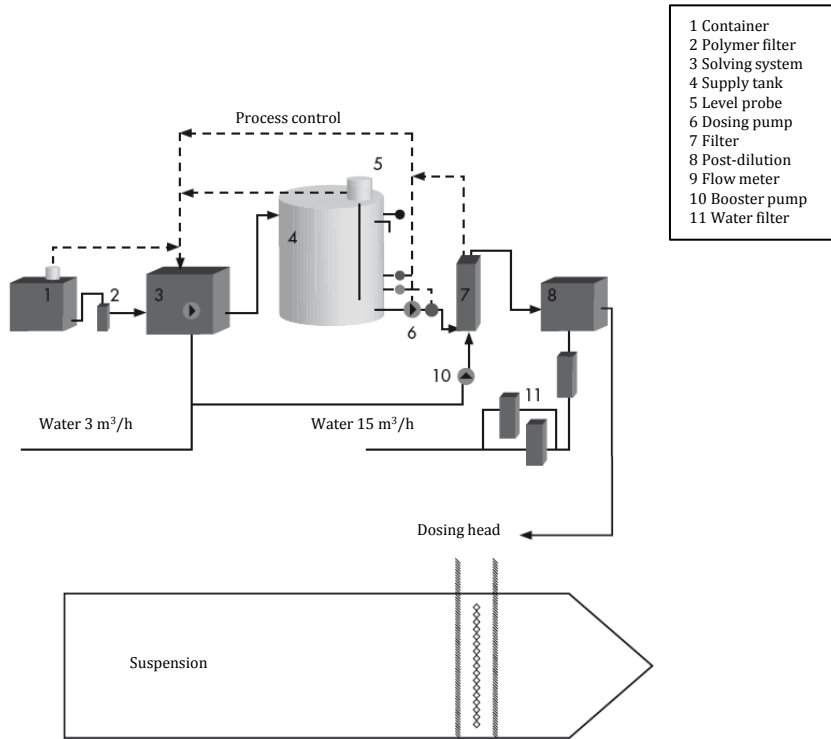
a process for the
paper industry. from us.



revolutionary vortex for the paper industry

The **ecowirl**[®] technology enables a new dimension of mixing and separating including new degasification and precipitation processes. The system has no moving parts and therefore guaranties a very high reliability. It is expected that the **ecowirl**[®] process will change many other industrial sectors and their processes.

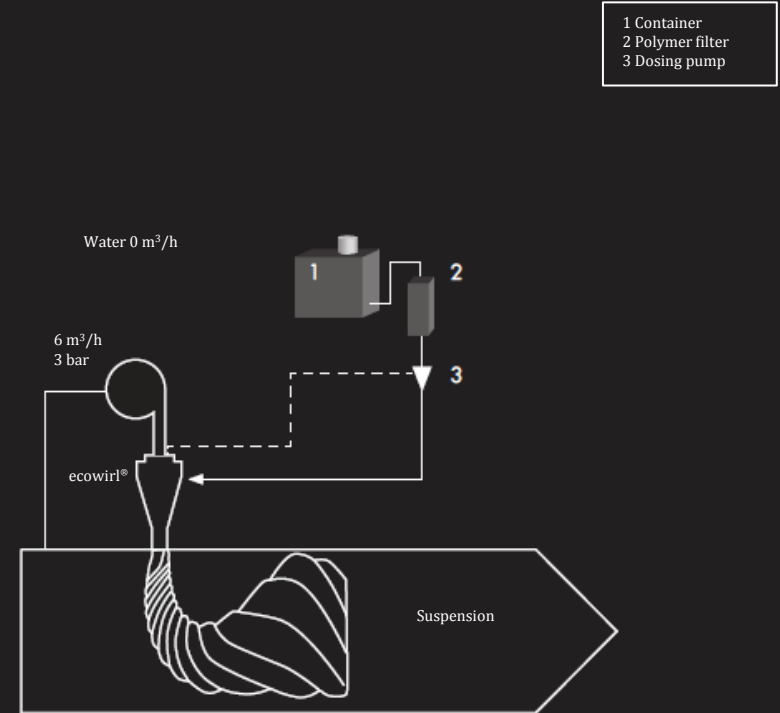
traditional mixing and dosing systems



expensive – high maintenance costs

Due to a large number of components and sensors, traditional mixing and dosing systems tend toward vulnerability to failures. Due to deposits on system components maintenance is obligatory. The dilution of fluids increases the fresh water consumption and, thereby, thermal circulation losses emerge.

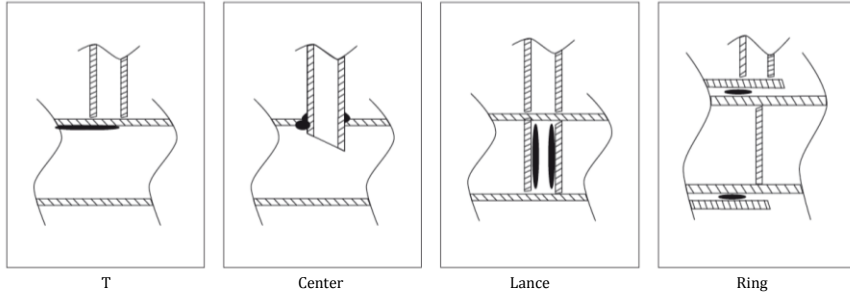
ecowirl[®] mixing and dosing system



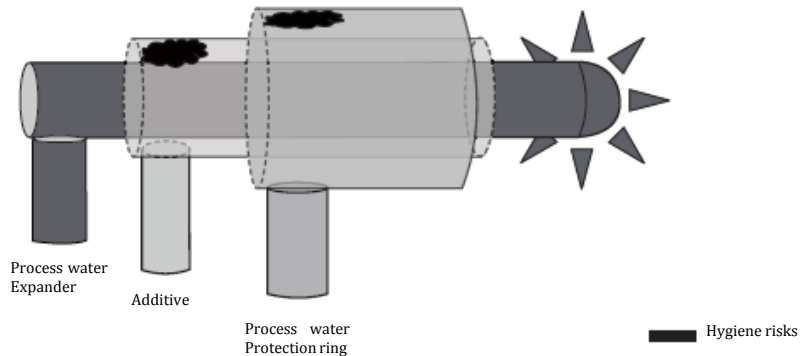
know innovations – use innovations

The **ecowirl[®]** technology uses available process water completely without need of fresh water supply. The system consists of only three components and a locking sensor. The continually flowing and self-cleaning design allows a sterile mixing and dosing process. The **ecowirl[®]** m stands out due to reliably, low-maintenance and efficient operation.

conventional mixing technique



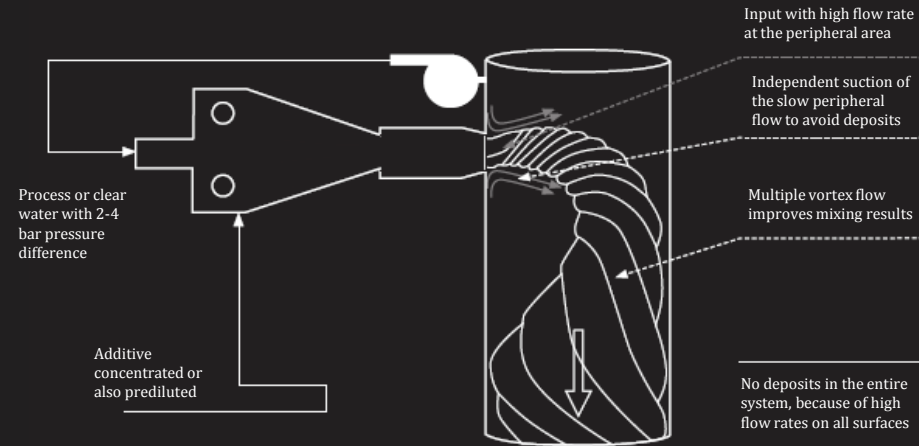
ring injection head



classic dosing heads

All traditional dosing heads potentially contain risks of contamination by reaction with substances in fresh water, particularly when trying to reduce fresh water. The ring injection head works with process water or thin pulp and has lower deposit risks due to the sufficiently high flow rates in the process water system. The additive line is more endangered since the inlet faces different flow rates for constructional reasons and due to variable input.

ecowirl® mixing technique



the ecowirl® m is an absolute maintenance-free mixing-system

The construction and all surfaces are self-cleaning. Directly introduced sterile additives with up to 50 % solid content are processed perfectly. The construction of this inflow is designed without low-flow areas. The ecowirl® m turbo-outflow leads to a flawless hygiene and mixing quality in the main pipe, as well. The entire ecowirl® m process meets the highest mixing and dosing demands: simple, compact, fast responding, hygienic and ecologic.

risks in traditional industrial manufacturing equipment

With traditional industrial manufacturing equipment, the production processes are at one constant risk: Paper defects and production interferences by polymer-spinning. Mostly, agglomerations in low-flow zones are responsible, particularly in combination with charged cationic and anionic polymers. In extreme cases, even bacteria are involved.

polymer-hygiene problems emerge by:

- > reaction with dilution water and its substances
- > low turbulences and quiet zones in containers
- > too low or too high velocities in the filter medium
- > a none-ideal positioning of the filter systems
- > low flow rate in tubes and pipes
- > dead-ended pipes as well as static bypasses on filter systems
- > bacterial growth in combination with polymer agglomerates
- > poor mixing on felts/screens (polymer particle $D_{90} < 2 \mu\text{m}$)

economic losses by polymer agglomerates:

- > ruptures on the paper, coater and roll cutting machine
- > interferences at the printer or further processors

damages by polymer-bacteria-agglomerates:

- > charred spots in highly charged press felts
- > screen holes in high-speed paper forming machines

ecowirl® technology

Optimal production processes require flawless industrial manufacturing equipment and this can be obtained with the patented **ecowirl®** technology. With the **ecowirl®** m, we provide your company the right tool, that will prepare you for future work and production processes.

details	process	effect
> Hygiene is guaranteed	High flow on all fluid limiting surfaces	Guaranty of hygiene
> Vortex	Generation in multiple rotary axes	Innovatively high contact rates Allowance of direct dosing of additives with solid content up to 50 %
> Water cluster	Opening Shredding	Increment of specific surfaces enhances the contact rate
> Substances in water	Shredding	Increment of specific surfaces enhances the contact rate
> Polymers	Elongation	Increment of chargeable surfaces Increase of additive effectiveness Improvement of cloudiness
> Process water use	Polymer-preloading in the premixing chamber	Stabilization of the elongated form Reduction of fresh water usage Reduction of heat losses
> Main stream injector	Vortex mixing Decreasing turbulences	Very good, fast intermixing Further systematic loading of polymers
> Total time	Total process below ½ second	Achieves the highest mixing and dosing demands

ecowirl® further systems

ecowirl® a

The **ecowirl®** aerator handles the creation and the mix-in of fine air bubbles. This system was developed for flotation and is also used for aeration or stripping of fluids.

ecowirl® e

The **ecowirl®** emulsifier system allows the production of oil in water emulsions, such as wet strength agents. It allows the mix-in of protective colloids at the same time.

ecowirl® s

The **ecowirl®** separation improves the effectiveness of the cyclonic separation and enables a reduction of the cascade number at the same time. Thereby, system expenditure and energy are economized.

ecowirl® p

The **ecowirl®** precipitation system allows the precipitation and separation of solved substances in pure and process water. It is suited to precipitate hardness components in water systems, such as heat exchangers, cooling towers and vacuum pumps with sealing water, in order to prevent depositions.

ecowirl® references

tönnemann & vogel gmbh co.kg, special papers

“As the first paper factory, we are relying on the **ecowirl®** technology for already a year. In the area of flotation, **ecowirl®** a and **ecowirl®** m. The **ecowirl®** m is also used for the retention agent. We witnessed an instant reduction of costs in retention agent of 25 % or an increase in the capacity of the entire system. The process idea – directly from the container – is really smart, and brings compelling economical results with significant simplification in the handling.”

Dipl.-Ing. Caspar Tönnemann, CEO

julius schulte trebsen gmbh & co.kg, testliner and corrugated board

“We have a paper machine with two fourdrinier wires and the same material input. The turbidity of the sieved water is in both cases electronically monitored and regulated by the inflow of retention agent. The adjustment control reduced the inflow by 30 % after using the **ecowirl®** m “smartmixer”. We reduced again the conventional amount of dose and our retention improved by 7.5 %. We have bought more Smartmixers.”

Andreas Kretschmer, head of technology Schulte & Söhne Trebsen

garda cartiere, wood-free coated paper

“We have successfully tested the **ecowirl®** m for several months for cationic polymers and we could witness a perfect hygiene in the entire area after the dosing. This is especially important for us, because we operate online coaters. We use the system now for the retention agent on our PM 3, directly preceding the headbox.”

Garda Cartiere, William Mascher head of production department PM

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