

ecowirl[®] d

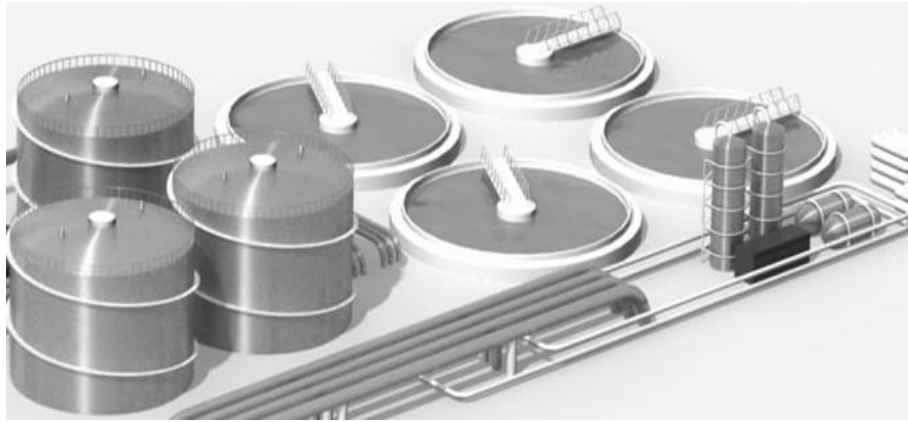
wastewater treatment



econovation[®]

the twirl behind your business

a process from the
wastewater treatment. so far.



mixing and dosing technique in the wastewater treatment

For the treatment of wastewaters from municipal and industrial sources a variety of aggregates for cleaning, flocculation, separation and filtration are necessary. The use of flocculating agents is especially widespread. They combine smaller pollutants to bigger particles so they can then be better removed from the wastewater. Liquid flocculation agents are commercially available as polymeric dispersions or emulsions with different molecular weights and cross-linking degrees. Often, there are large-scale preparation units that allow a pre-maturation of the polymer in batches by stirrers and implement a dosification from a storage vessel. The cost concerning the system, energy and maintenance expenditures is high and should be optimized.

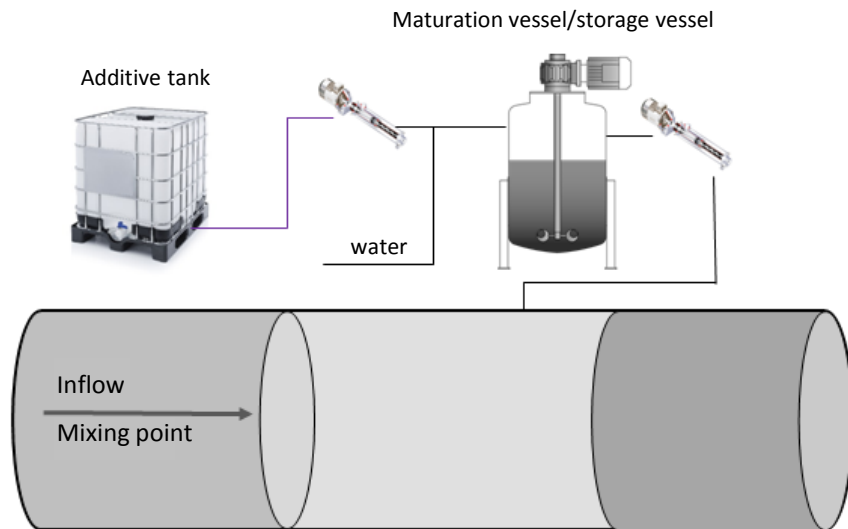
a process from the
wastewater treatment. from us.



revolutionary vortex for the wastewater treatment

The **ecowirl**[®] technology reveals a new dimension of mixing gases and liquids. The system manages the task of treatment and more efficient mixing of the additive into the stream that needs to be treated. The **ecowirl**[®] has no moving parts and therefore guaranties a very high reliability. The usual maturation time is reduced in the **ecowirl**[®] to less than a second by the treatment of the polymer with a multidimensional vortex field.

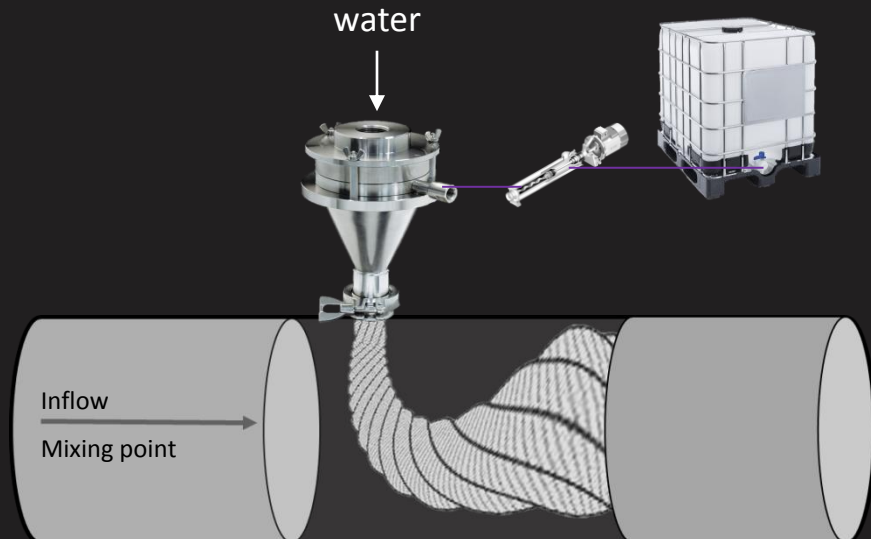
traditional supply preparation and dosing systems



expensive – high energy, cleaning, and maintenance costs

Due to a large number of components and sensors, traditional mixing and dosing systems tend toward vulnerability to failures. Maintenance is obligatory due to deposits on system components formed by the first reaction with fresh water. The mixing quality in the stream that needs to be treated is often insufficient due to aggregates and water saving. The additive is not completely used.

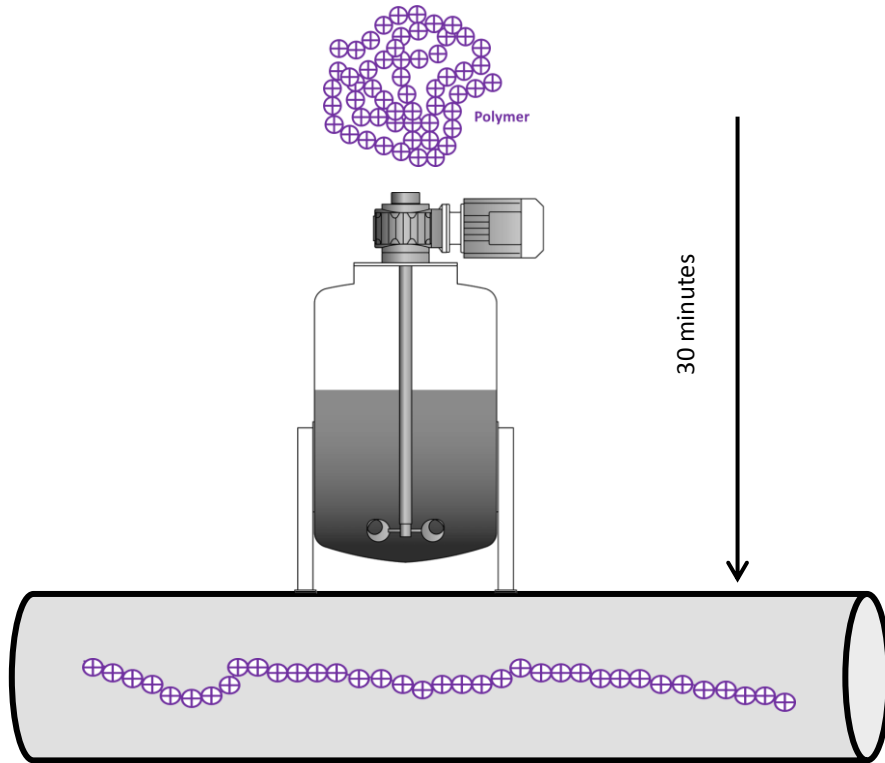
ecowirl® mixing and dosing system



the ecowirl® d is a maintenance-free multi-talent

The vortex field technology guarantees clean surfaces in the two stages of the mixing process. Directly introduced sterile additives with up to 50 % solid content are processed perfectly. The construction of this inflow is designed without low-flow areas. A check-valve prevents contamination of the additive in the container. The turbo-outflow provides a flawless hygiene and mixing quality in the main pipe. The entire ecowirl® d process meets the highest mixing and dosing demands and is simple, compact, fast responding, hygienic and ecologic.

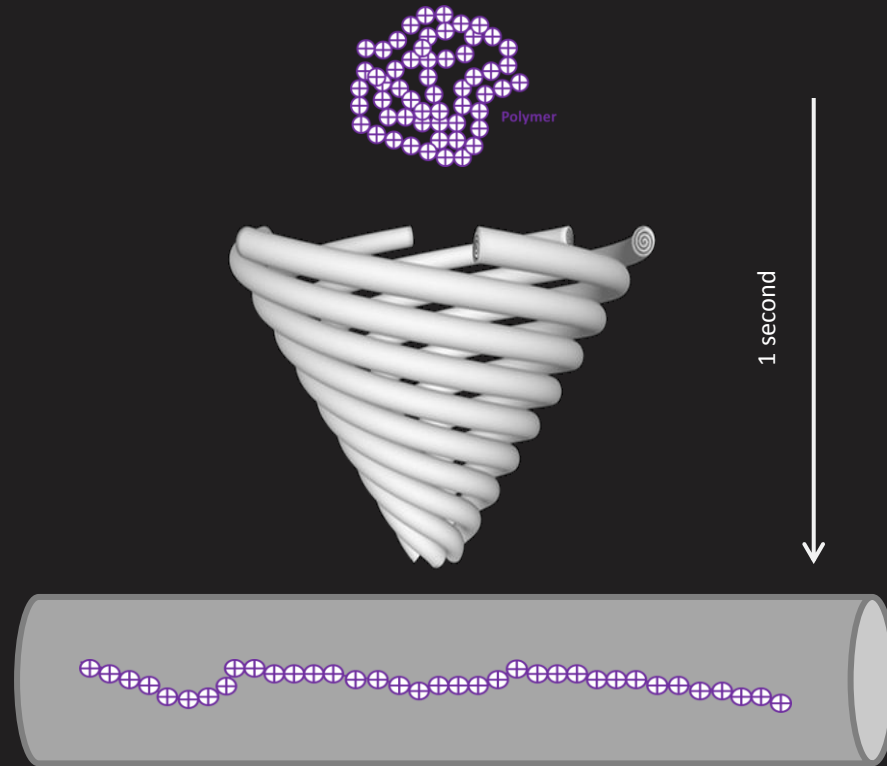
conventional polymer maturation



classic polymer preparation and dosing options

Classically, the commodity is stirred and then it is mixed together with fresh or well water in a container for several minutes. The stirring time is highly dependent on size, cross-link and charge of the polymer. Usually, the time is between 15 and 45 minutes. Then it is dosed into the main stream or into a basin. Traditional dosing points in the waste water treatment are often simple installations. In the worst case, an additive is dosed in the free outflow without distribution in the basin. Even simple pipe-in-pipe constructions can be found. The disadvantages of these systems can be a high additive consumption by poor distribution in the water.

ecowirl[®] inverting in seconds



the ecowirl[®] d – polymer maturation in seconds

The dosage of a undiluted polymer is carried out through a Mohnno-pump directly into the vortex field of the ecowirl. The turbulences in the process water and the associated constant pressure change in the rotating single vortices as well as the friction between the polymer and the water or rather its solved substances lead to a fast, complete polymer stretching. By the use of the entire **ecowirl[®]** vortex field, the mature polymer reaches its full development after approximately a second. The residual energy of the vortex field is used for fast, consequent mixing in the main stream.

risks in traditional industrial manufacturing equipment

Traditional mixing and dosing systems in waste water treatment plants are often not designed for optimal functionality. Frequently, overdosage occurs e.g. of flocculation agents, because no optimal intermixing is ensured with the available technique. In addition, using polymer stations with preparation and maturation tanks, regular cleaning becomes necessary.

polymer-hygiene problems emerge by:

- > Reaction with dilution water and its substances
- > Low turbulence and slow flow areas in storage containers
- > Little flexibility by continual batchwise preparation
- > High costs of operation by many aggregates
- > Maintenance- and cleaning-free

ecowirl® technology

Optimal production processes require flawless industrial manufacturing equipment and this can be obtained with the patented **ecowirl®** technology. With the **ecowirl®**, 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 chargeable surfaces Increase of additive effectiveness Improvement of cloudiness |
| > Polymers | Maturation and 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® m und ecowirl® m²

The **ecowirl®** mixer is the classic system for uniform mixing of one or more additives. The dosing process is suitable for the parallel mixing, for example for color mixtures. Furthermore, the method is suitable for sequential mixing, such as glue and fixing agent.

ecowirl®

references

Neenah Gessner

The first ecowirl d 50 was installed in the inflow of to the sedimentation basin for a direct addition of flocculants. Compared to previous inverter system, 40% of the commodity product can be saved. Furthermore, the spatial complex inverter system could be saved. In a further step, a second ecowirl was set to the sludge dewatering container to discontinuous dosing of a polymer. Again, product savings could be reached with the ecowirl. The systems have been successfully running for more than two years.
Armin Niederhuber, head of production

Moritz J. Weig

At the inflow to the Purgomaten, an ecowirl d 100 was installed for direct flocculant addition. The flocculant is boosted with a progressing cavity pump to the ecowirl and there diluted and pre-matured during dosing. The ecowirl works with 5 m³ clear water and the operation runs to a level comparable to the traditional system. If the process water volume could be increased to 7 m³, a saving of the emulsion polymer would probably be possible.

Peter Molitor, Hening Dippel, head of production

Sappi Alfeld

For the dosage of PAC to the paint coagulation a small ecowirl d was installed in the inflow to the coagulations container. Due to the PAC, the ecowirl was made entirely from plastic. The system has been running for more than 1.5 years and brings a product saving of about 10%.

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