



# Clean water with tertiary purification

SIPAPER<sup>CIS</sup> Water – Intelligent water concepts

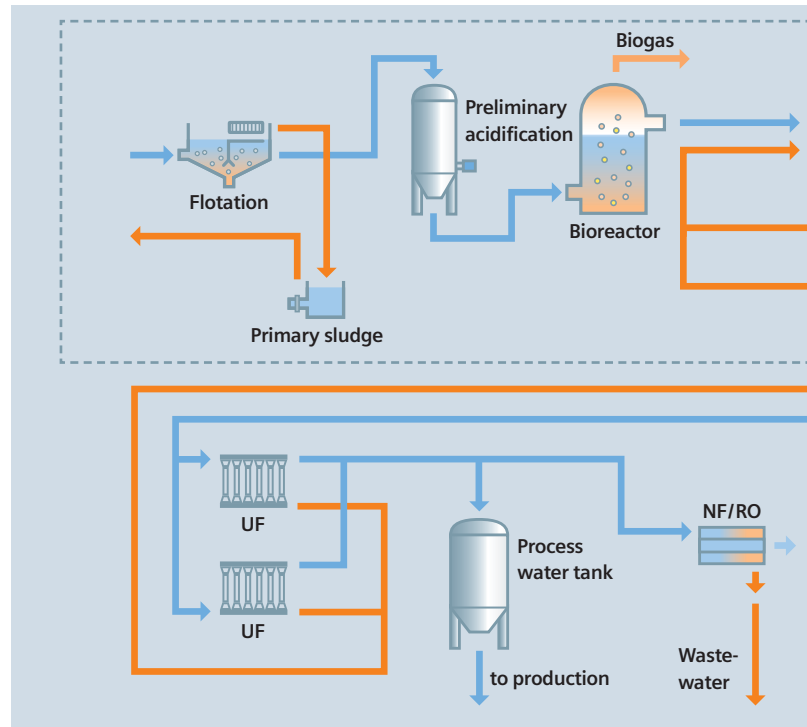
Industrial Technologies

**SIEMENS**



# Pure innovation: Tertiary water treatment

Minimize your water resources with tertiary wastewater purification from Siemens. This innovative membrane technology guarantees water treatment of the highest quality, and is both reliable and environmentally compatible.



## Your requirement: Efficient water treatment

The paper and pulp industry faces challenges on the ecological and economic fronts. While paper prices stagnate, the costs for oil, electricity, raw materials, water and the disposal of wastewater are rising. These are key cost factors that impact companies' production processes which are both energy- and water-intensive.

As a result, there is a growing need for solutions to minimize production-related water consumption. This calls for groundbreaking technologies that are economical, environmentally compatible and effective. This is why membrane technology is playing an increasingly important role.

## Our solution: Innovative membrane technology

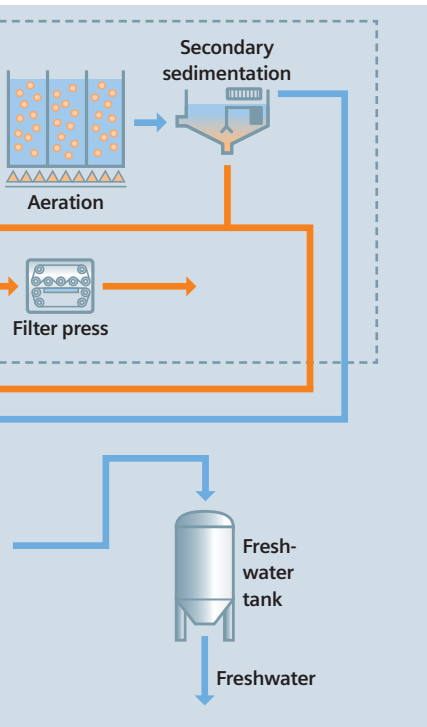
Membrane technology from Siemens is already the standard in the oil, gas and food industries. The hallmarks of these compact-format membranes are their reliability and efficiency. A membrane module is made up of several thousand polyvinylidene fluoride fibers (PVDF) fibers.

In the water treatment area, this technology produces outstanding results and the highest water quality. The past few years in particular have seen a huge surge in development work in membrane technology. Our membranes are very rugged, and are resistant to biofouling, scaling and chemical attack which increases their service life considerably. Siemens membranes ensure high water quality and are significantly cheaper than they were a few years ago thanks to optimized production processes and higher output.

### Ultrafiltration – preliminary stage for further purification processes

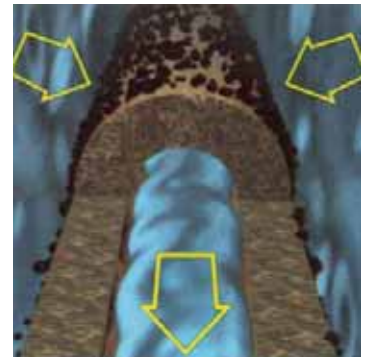
Ultrafiltration is a process designed to reduce solids. It makes the ideal pretreatment for a downstream nanofiltration or reverse osmosis plant. The filtrate, which is totally free of solids, can be used in the on-going process as seal water, for spray pipes and for diluting chemicals.

We offer you an efficient means of nanofiltration featuring extremely high flow rates. Our purification system is made up of efficient individual modules. We can match these specifically to your plant and they can be installed quickly and cheaply. It is also possible to expand the configuration at any time to increase throughput.



## Your advantages

- First-class water quality for reuse
- Reduction of wastewater
- Reduction in the quantity of fresh water used
- Low maintenance costs thanks to integrated, fully automated cleaning system



## Performance features of tertiary water treatment

### Great flexibility

The Siemens tertiary water treatment plant consists of standardized treatment technologies. The system can be installed at low cost and expanded at any time thanks to its modular design.

### Fully integrated cleaning

A three-stage, fully automated cleaning process runs while the plant is in operation.

- Stage 1: Deposits of solid substances are cleared from the membranes every 10 to 30 minutes depending on the quality of the raw water by intensive air flushing for one or two minutes.
- Stage 2: Integrated maintenance cleaning is carried out regularly on a one to three week cycle. This prevents surface contamination and reduces the risk of fouling. A small dose of cleaning agent is injected into the filtrate to clean the membrane.
- Stage 3: Chemical cleaning by means of CIP system (Clean-in-place). This is an intensive cleaning process using different chemicals depending on the application. This fully automatic cleaning process lasts 4–8 hours and is carried out at intervals of 4–12 weeks. The chemicals used are neutralized and fed back into the filtration process again.

### Increased quality

In order to further optimize the water quality, you can expand the ultrafiltration system at any time with a nanofiltration or reverse osmosis system downstream. This technology is essential in highly restricted water cycles since it guarantees the necessary desalination and decarbonization.

### First-class water quality

Water purified with the Siemens tertiary wastewater system can be used entirely for recycling for specific purposes because of its excellent quality. Even a partial flow solution produces impressive results and is extremely economical to implement in practice.

### Continuous further development

Continuously optimizing and further developing our products is one of our top priorities. At the moment, we are working on an oxidation process for treating concentrates occurring during nanofiltration and reverse osmosis in order to deal with constituents that are either not bio-degradable or are difficult to degrade biologically. The chemical values as well as the sum parameters for direct or indirect introduction are significantly improved by the new technology. Be sure that your company profits from the research strength of our development team – with the latest innovations that the market has to offer.

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