

## Raw-water Ultrafiltration ULTRASTIL TW

### Raw-water Ultrafiltration Systems for Production and Refining of Drinking Water

Drinking water for human consumption is the most important foodstuff. Other consumers such as pharmaceutical and life-sciences companies, the food and beverage industry, the semiconductor industry and power generation utilities need drinking water or water of the same quality. The availability of such water can be a decisive factor in the selection of a factory location.

Today, increasing amounts of drinking water must be produced from water taken from:

- Rivers
- Lakes
- Reservoirs or
- Karstic areas

Due to the effects of the climate and the environment, the particle content of such water may vary greatly.

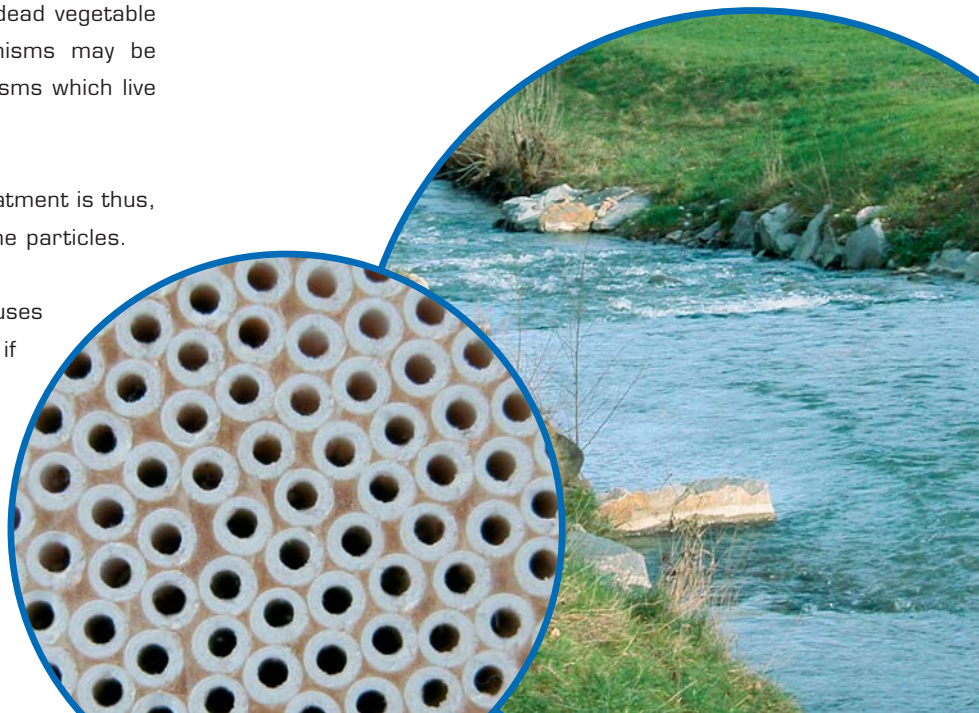
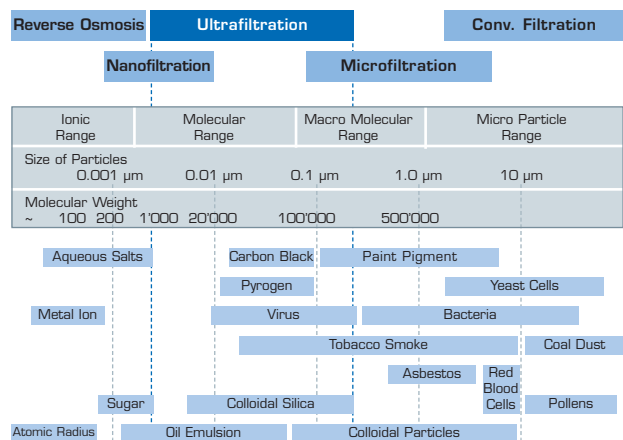
The particles are inorganic (sand, clay, rust) and organic substances.

The organic substances may be living or dead vegetable and animal organisms. The living organisms may be germs and other undesirable microorganisms which live from vegetable organisms.

The most important objective of water treatment is thus, for reasons of hygiene, to remove all of the particles.

The very small size of bacteria and viruses means that a reliable system is needed if they are to be removed effectively. The best method of doing this is by ultra-filtration.

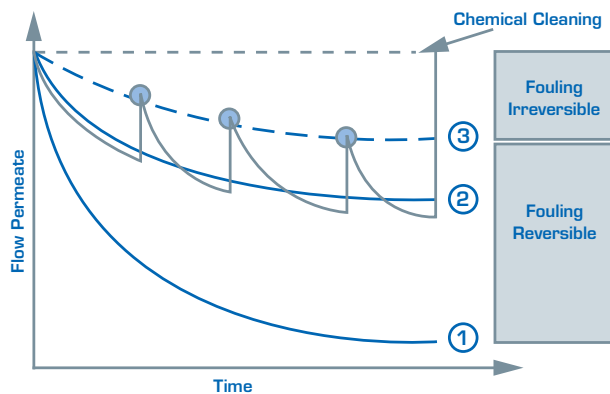
### Spectrum



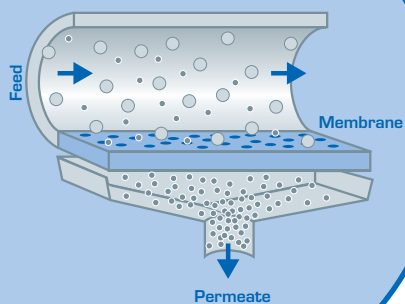
## Process Control

In the membrane separation processes microfiltration and ultrafiltration, a distinction is made between static (dead-end) and dynamic (cross-flow) filtration. In most cases the water passes through the hollow-fibre membranes from the inside to the outside and backwashing to remove the accumulated deposits is carried out from the outside to the inside. In the case of dead-end filtration, the water passes through the membranes and the particles are deposited on the surface of the membrane, where they gradually accumulate to form a layer.

This layer of particles is removed at regular intervals by backwashing, thus maintaining a constant rate of flow through the filter.



In cross-flow filtration, the water flows over the surface of the membrane. Just as in dead-end filtration, the particles are deposited on the surface of the membrane, but the cross-flow of water prevents the layer of particles from growing above a certain thickness.



For controlled dead-end filtration, Christ relies on a quantity-dependent process control system. If the number of particles in the water varies greatly, the systems can be operated in either dead-end mode or cross-flow mode.

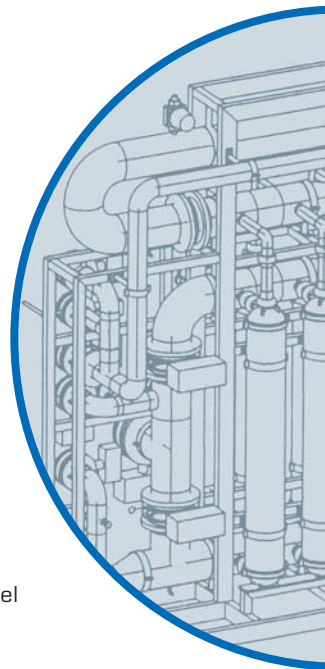
## System & Operation Concept

The central element of any membrane system is the membrane modules. All other system components form the periphery and consist of a backwashable coarse filter upstream of the membrane filter, an optional raw-water storage tank which acts as a buffer and decouples the system from the raw-water supply, a pressure booster pump, the filtrate storage tank which holds the backwashing water and backwashing pumps for cleaning the membrane modules. The ultrafiltration system ULTRASTIL TW was developed by Christ especially for the treatment of drinking water.

## Very Economical Operation

Christ ULTRASTIL TW systems have the following features:

- High retention rate for particles, germs, bacteria and viruses
- Use of membranes with a cut-off of 100 – 200 kD as a standard
- Considerably smaller than systems which use conventional flocculation and filtration
- Modular design
- Less work for the operating personnel due to fully automatic operation



The water filtered in the hollow-fibre membrane elements is collected in the filtrate storage tank, from which it is distributed to the consumers.

After a preset volume of water, which depends on the quality of the raw water, has passed through the filter, the filtration process is interrupted in order to backwash the membrane modules with filtrate. If necessary, it is also possible to clean the membrane elements with chemicals. Under normal operating conditions, ultrafiltration systems achieve a water yield of up to 95%.

### Constant Top Quality

- The systems comply with the requirements of the drinking-water laws with respect to quality-relevant parameters such as the turbidity and the particle content.
- Continuous operation

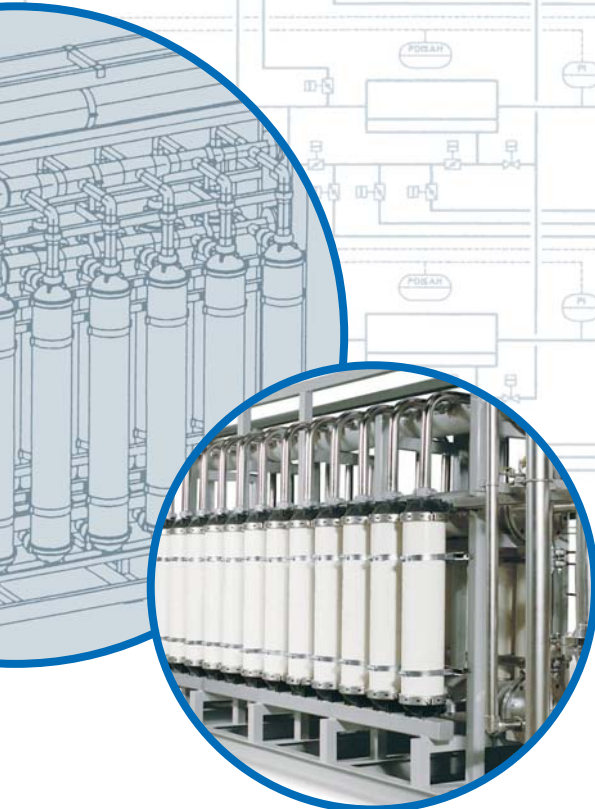
### Maximum Product Safety & Easy Operation

- All components comply with the drinking-water requirements
- Fully automatic operation
- Operation in dead-end or cross-flow mode, depending on the quality of the raw water

### Typical Quality Parameters of an Ultrafiltration System

Almost 100% of substances and bacteria which cause turbidity are removed. Dissolved substances such as salts are not filtered out.

	Retention
Turbidity	< 0.1 NTU
Bacteria	3 – 4 log
Viruses	> 5 log





## Pilot Systems & Service

CHRIST designs and manufactures turn-key systems to meet their customers' specifications. Several pilot systems in which various membrane and module types can be used are available for the optimization of the process parameters. This permits the operating conditions to be determined in advance and also allows optimal dimensioning of the future system.

CHRIST provides servicing and preventative maintenance for all plants it supplies. A remote-diagnosis system permits rapid assessment of the situation, the implementation of specific countermeasures and the continual monitoring of the most important process parameters.

**CHRIST ultrafiltration systems contribute decisively to the production of drinking water and its quality.**

Please check [www.christwater.com/addresses](http://www.christwater.com/addresses) to find your local CHRIST partner.

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