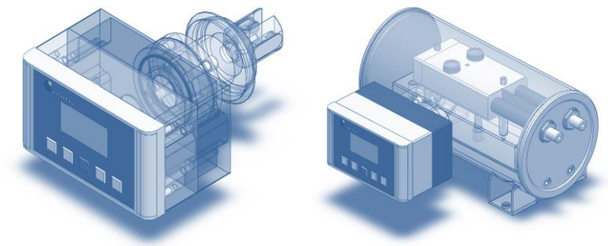
The Centec Group

Centec is a privately owned group of companies. A core business for us is customized systems for the production and distribution of high purity water and water for injection (WFI) for pharmaceutical and biotechnological plants in accordance with GMP and FDA guidelines. We are an experienced partner for pure steam generation, CIP- and SIP-processes as well as for services related to product preparation. Centec technology includes a range of high precision process sensors for accurately measuring critical product properties such as the concentration of acidic and caustic solutions and O_2 content. The largest pharmaceutical groups in the world are among our key customers.



Accuracy. Reliability. Centec.

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Water Purification Waste Water

Ultrafiltration of Waste Water

Centec Pharma Systems

More information at **www.centec.de**

Automated process skids and high precision sensors from a single source. Centec.

Waste Water Purification

The Principle

The Centec waste water purification system contains proven membrane filtration technology successfully applied by customers worldwide. Waste water is pumped from the accumulation reservoir into an operational tank through a belt filter. Once the desired level in the tank has been reached, the operational mode starts. The water streams under pressure, at high velocity through a system of semipermeable multi-channel ceramic membranes. It is divided into purified water (permeate) and impure water (concentrate). Due to their chemical, thermal and mechanical stability, the ceramic membranes are perfectly suited for waste water processing in pharmaceutical and chemical applications. The operational mode switches off as soon as the level in the tank reaches its minimum. During operation the membrane pores become progressively clogged. When the equipment capacity drops below a pre-set lower limit the membrane units are automatically regenerated to regain the original flow performance. Ultrafiltration pore sizes range from 0,01 to 0,1 µm. This technology allows the removal of particles like bacteria, viruses, suspended oils, etc. – also many dissolved colours and some odours are removed.

- **Application Specific and Energy Efficient**
  applying most sophisticated ultrafiltration modules
  waste water post-treatment technologies on demand
- **Modular Design with Standard PLC**
  skid mounted for easy installation and start-up
- **In Compliance with USP, ASME, GMP, FDA, ISPE**
- **Completely Qualified (DQ, IQ, OQ)**
- **Low Operating and Maintenance Costs**

Experience. Expertise. Centec.

Water Softening & Demineralization · Ultrafiltration · Reverse Osmosis · Electro Deionization
WFI Distillation · Membrane Deaeration · Column Deaeration · Vacuum Deaeration · Multi Component Mixing
Additive Dosing · Flash Pasteurization · Cleaning-in-Place · Sterilization-in-Place · Pure Steam Generation

Technical Data

Capacity	according to requirements
Residual Solids	< 3 mg/l
pH of Waste Water	2 - 14
Temperature of Waste Water	max. 55 °C
Temperature of CIP	max. 85 °C
Material	1.4404/1.4435/... AISI 316L/... electropolishing possible
Surface Finish	Ra < 0,4 possible
Ferrite Content	< 1 % possible
Membrane	ceramics
PLC	SIMATIC S7
Options	neutralization disinfection

The Centec production is certified according to ISO 9001.