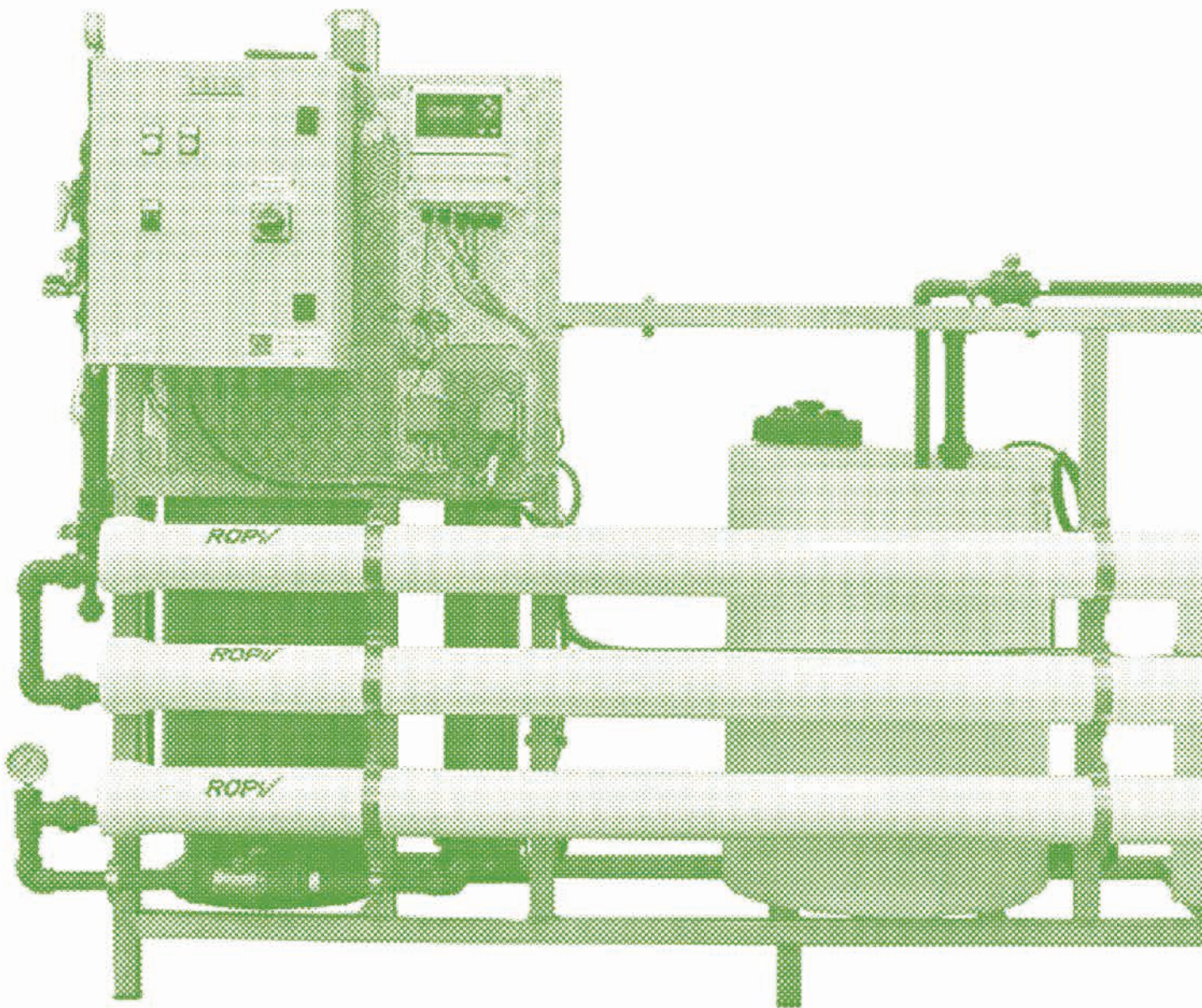


MEMBRANE FILTRATION

ADVANCED FILTRATION TECHNOLOGIES



MEMBRANE FILTRATION

Filtration systems for water or process solutions which are passed through a spiral wound membrane or filter to produce purified water (**permeate**) and separate suspended solids, colloids, metals and dissolved salts (**concentrate**).

There are several different types of filtration technologies depending on the filtration grade. **Microfiltration** and **ultrafiltration** are applied when filtering larger particles. Since this results in larger porosities, filtration output is higher and pressure applied is lower.

For smaller molecules like dissolved salts or organic compounds to be removed, **nanofiltration** and **reverse osmosis** are used.

In this case the applied pressure is higher and the output yield is lower.

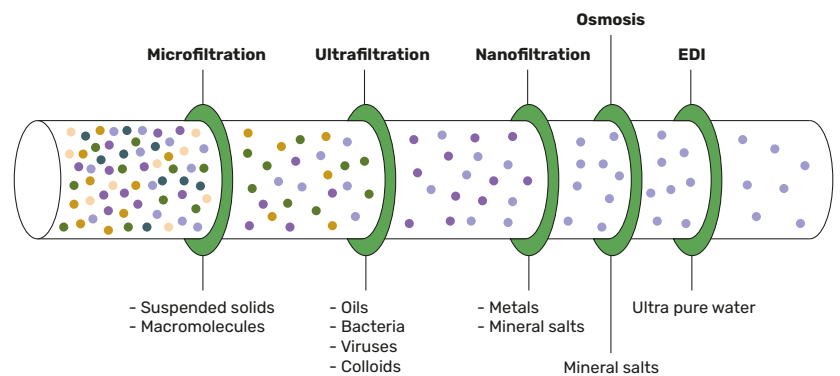
These are cross-flow filtrations as the flow of the solution to be filtered is tangential to the membrane.

To obtain **ultra-pure water**, after demineralizers or reverse osmosis **electrodeionization** systems with ion-selective membranes (EDI) are used.



Sectors

- Electroplating
- Powder coating pre-treatment
- Cataphoresis and electrophoresis
- Ultrasonic cleaning and PVD
- Pharmaceuticals
- Electronics and semiconductors
- Chemical industry
- Steam generators
- Textile industry



REVERSE OSMOSIS - RO Series

Cross-flow filtration plants at **high-pressure** (from 10 to 60 bar) for city, well or process water on spiral-wound membranes to separate permeate (low in salts) from pollutants (concentrate). The salts retention capacity of the membranes can reach up to **> 98%**. SAITA produces standard and custom reverse osmosis systems.

Specifications

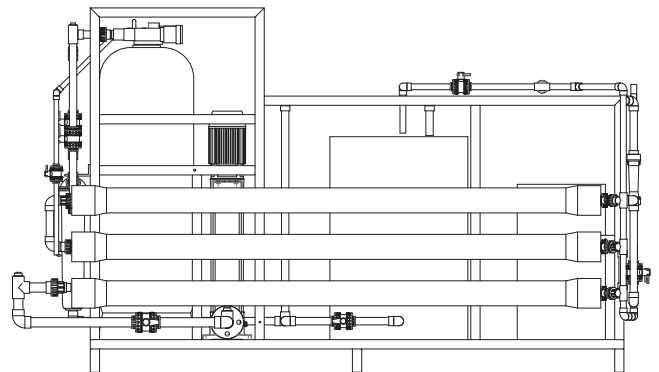
Reverse osmosis plants consist of a high-pressure pump, a pre-filtration stage with microfiltration cartridges and reverse osmosis modules consisting of vessels containing the **spiral wound polymeric membranes**. The operating cycle is automated using an electronic programmer. Options may include pre-treatment of the inlet water and an automated membrane cleaning system.

Applications

- Demineralization
- Desalination
- Water purifying
- Process solution purification
- Zero liquid discharge

Advantages

- Permeate conductivity < 20 µS/cm
- Low use of chemicals
- No regeneration effluent
- Salts removal > 98%
- Ideal for high salts concentrations



MODELS	PERMEATE (Lt/h)	REMOVAL	RECOVERY	INSTALLED KW
R090	90	> 98%	50 - 75%	0,55
R0250	250	> 98%	50 - 75%	1,1
R0500	500	> 98%	50 - 75%	1,1
R01000	1000	> 98%	50 - 75%	2,2
R02000	2000	> 98%	50 - 75%	3
R04000	4000	> 98%	50 - 75%	5,5
R09000	9000	> 98%	50 - 75%	11

NANOFILTRATION - NF Series

Nanofiltration is a membrane-based separation process that is used to filter process solutions through a **spiral wound membrane**. With porosity ranging from 200 to 1000 Daltons, industrial applications include the purification of aqueous solutions, softening and selective filtration of particular molecules.

Specifications

Nanofiltration systems such as reverse osmosis consist of a high-pressure pump, a pre-filtration stage with micro-filtration cartridges, and modules holding the vessels containing the polymeric membranes. The operating cycle is automated using an electronic programmer. As option it might be included an automated cleaning system to restore membranes productivity.

Applications

- Process solution purification
- Softening
- Removal of organic pollutants

Advantages

- Low use of chemicals
- No regeneration effluent
- Membranes with cut-off for large molecules

HOLLOW FIBER ULTRAFILTRATION - UFH Series

Hollow fiber ultrafiltration membranes are used to remove impurities such as suspended solids, colloids and bacteria. The UF modules are consisting of vessels containing the hollow fibers made of PES or PVDF material.

Filtration can be from outside to inside of the fibers or vice versa.

Ultrafiltration with hollow fibres is typically used for pre-filtration prior to reverse osmosis membranes or for well water filtration. The fibres are washed in cycles using chemicals and compressed air. Average pore diameters range from **0.005** to **0.1 microns**.

Specifications

Hollow fiber ultrafiltration plants feature a skid containing feed pump, ultrafiltration modules, process instruments and an automated cleaning and sterilization system. The operation and cleaning cycle are managed by an electronic programmer.

Applications

- Reverse osmosis pre-filtration
- Well water filtration
- Zero liquid discharge

Advantages

- Removal of suspended solids and colloids
- Bacteria removal
- Low consumption of chemicals

ULTRAFILTRATION WITH CERAMIC MEMBRANES

UF Series

Cross-flow filtration plants using tubular membranes made of ceramic materials to purify and regenerate process solutions contaminated with pollutants such as: oils, grease, colloids, and suspended solids. The porosity of the membranes (**0.4 to 0.04 microns**) allows to retain high porosity molecules.

The ceramic material of which they are composed (**silicon carbide, alumina, or titanium oxides**) allows to filter **acidic** or **alkaline** solutions at temperatures up to **80°C**.

Specifications

UF series ultrafiltration systems are installed on skids which have a collection/recirculation tank, recirculation pump, vessels containing the membranes, permeate collection tank complete with relaunch pump and a cleaning tank. The entire system is automated and managed by an electronic programmer. Optional equipments include the installation of an heating element to improve the cleaning and filtration process.

Applications

- Removal of suspended solids and colloids
- Detergent regeneration
- Degreaser regeneration
- Cleaning of oil-contaminated water
- Bacteria removal

Advantages

- Detergents and Degreasers savings
- Concentrate discharge < 30%
- pH 0-14
- Effective even at high temperatures
- Effective removal in emulsion oils



ELECTRODEIONIZATION

EDI Series

Electro-deionization plants are used to produce **ultra-pure water** from demineralized water.

The output water produced has an high standard of purity with resistivity **>18 MΩ x cm.** and are used as an alternative to mixed-bed resin filters. Featuring electro dialysis cells complete with an anode and a cathode separated by cation and anion membranes.

When placed between the membranes, the liquid is exposed to the electric field which deflects the ions in the solution towards the electrodes (depending on the sign of their charge) thereby producing two streams: permeate (ultra-pure water) and concentrate.

Specifications

Electrodeionization systems can operate either continuously or discontinuously and depending on requirements, different units can be arranged in series or in parallel. EDI modules are installed on skids complete with feed pump, current rectifier, process instruments and a cleaning system. The entire system is automated and managed by an electronic programmer.

Applications

- Ultra-pure water production
- High removal of ionic species
- Alternative to mixed-bed resins

Advantages

- Ultra-pure deionized water >18 MΩ
- Low use of chemicals
- No regeneration effluent
- Small footprint

