UFS Ultra Filtration Systems

Key Features

- Removal of feedwater turbidity
- Constant filtrate quality
- >99.9% bacterial and virus rejection
- Low energy and water consumption
- Fully automated PLC control
- Compact skid mount design
- Optional pressure pump/valve skid

Applications

- Surface water clarification
- RO pre-treatment
- Waste water treatment
- Dewatering of concentrate solutions

Process Description

Ultra-filtration is a membrane filtration process using a differential pressure across a membrane surface to separate particulates from a feed source. ROtek UFS systems use hollow fibre tubular membrane designs with tailored molecular weight exclusion pore sizes. ROtek UFS systems are designed to remove high molecular weight contaminants, colloids, bacteria, organic and inorganic polymeric materials and any contaminant with a molecular weight above 50,000 Daltons from a feedwater supply. Ultra-filtration systems use less than 20% of the energy required by reverse osmosis systems at significantly lower pressures.

Pure Water, Simple Solutions

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UFS Ultra Filtration Systems

ROtek UFS Description

ROtek UF systems are used to remove turbidity, particulates, microbial contaminants and high molecular weight contaminants from a feedwater supply. Permeate exiting the system is of a consistent quality regardless of variations in feedwater sediment loads. The hollow fibre membranes are operated in either dead-end or cross-flow configurations. Each UFS system is controlled by an integrated PLC with flexibility to tailor the system to suit a wide range of applications. An (optional) pump and valve skid is used if pressurised supplies are not available for the feedwater or clean water used for back-flushing. This option is integrated with the UFS skid PLC and allows for programmed automatic back-flushing of the UF membranes with clean permeate water on a timed or differential pressure basis to maintain system performance. The backflush cleaning process may be supplemented with approved cleaning chemicals if required through a chemical injection/dosing system.

Available models

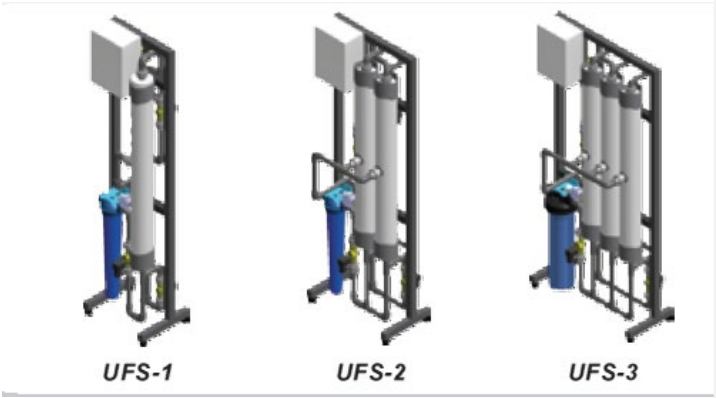
Model	UF modules	Flow rate	Connections	Dimensions (lwh)	Weight
UFS-1	1 x 5040	800-1500 lph	¾", 20 mm	410x320x1630 mm	50kg
UFS-2	2 x 5040	1500-2500 lph	1", 25mm	550x360x1630 mm	75kg
UFS-3	3 x 5040	2500-3500 lph	1", 25mm	740x360x1630 mm	100kg

Pressure pump and dual inlet valve system (Optional)

Model	Pump type	Connection port size	Suits UFS Model
UFP2-30	Stairs HBI2-30	¾", 20mm	UFS-1
UFP4-30	Stairs HBI4-30	1", 25mm	UFS-2 and UFS-3

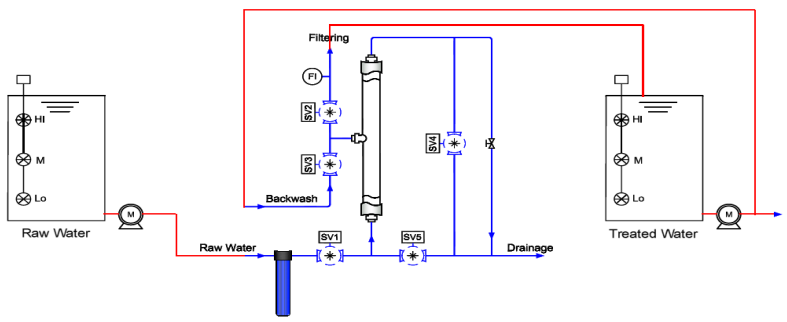
Optional Accessories

- Manual control
- HMI touch screen control panel
- Auto backwash 50µm pre-filter
- Additional pre-treatment stages:
  - Chemical dosing system
  - Evolet anti-scale filter
  - Clino X media-based 5µm backwashing sediment filter
- Air scouring connection points
- UV sanitation lamp



Feedwater Parameters

Turbidity	<120 NTU
TSS	<100 ppm
Temperature	<45°C
FAC	<50 ppm
Oil & Grease	<1 ppm
COD	<60 ppm
TOC	<20 ppm
pH	2-10



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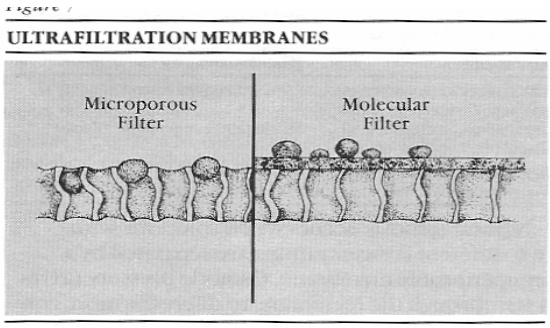
Ultra Filtration Systems

Ultrafiltration is the method of choice in many water filtration applications where variable suspended solids loads is commonplace and where removal of bacterial and organic contamination is desirable. The table below illustrates the place of ultrafiltration in comparison with other water purification technologies.

Method	Dissolved ionised solids	Dissolved organics	Dissolved ionised gases	Particulates	Bacteria	Pyrogens
Deionisation	Excellent	Poor	Excellent	Poor	Poor	Poor
Adsorption	Poor	Excellent	Poor	Poor	Poor	Poor
Filtration	Poor	Poor	Poor	Excellent	Excellent	Poor
Ultrafiltration	Poor	Good	Poor	Excellent	Excellent	Excellent
Reverse osmosis	Good	Good	Poor	Excellent	Excellent	Excellent
Distillation	Excellent /Good	Good	Poor	Excellent	Excellent	Excellent
UV oxidation	Poor	Good	Poor	Poor	Good	Poor



While a microporous membrane filter removes particles according to pore size, ultrafiltration membranes function as a molecular sieve, separating dissolved molecules out of the feedwater or source material based on particle and molecular size by passing the solution through diminutively small pore size filters.

An ultra-filter is a robust, selectively permeable membrane that retains most macromolecules above a particular molecular weight (10K and 40K are commonly used). Retained materials include colloids, micro-organisms and pyrogens while smaller molecules such as ionised contaminants or solvents will pass through. Ultra-filters may be regenerated and as such play an expanding role in water treatment systems, particularly due to their pyrogen removal capability.

Ultra-filtration may be combined with UV sanitation systems for a double stage microbial barrier. Chemical dosing systems for sodium hypochlorite ("hypo") may also be integrated into the systems for additional protection with a residual sanitiser to have the best protection from microbial contamination.

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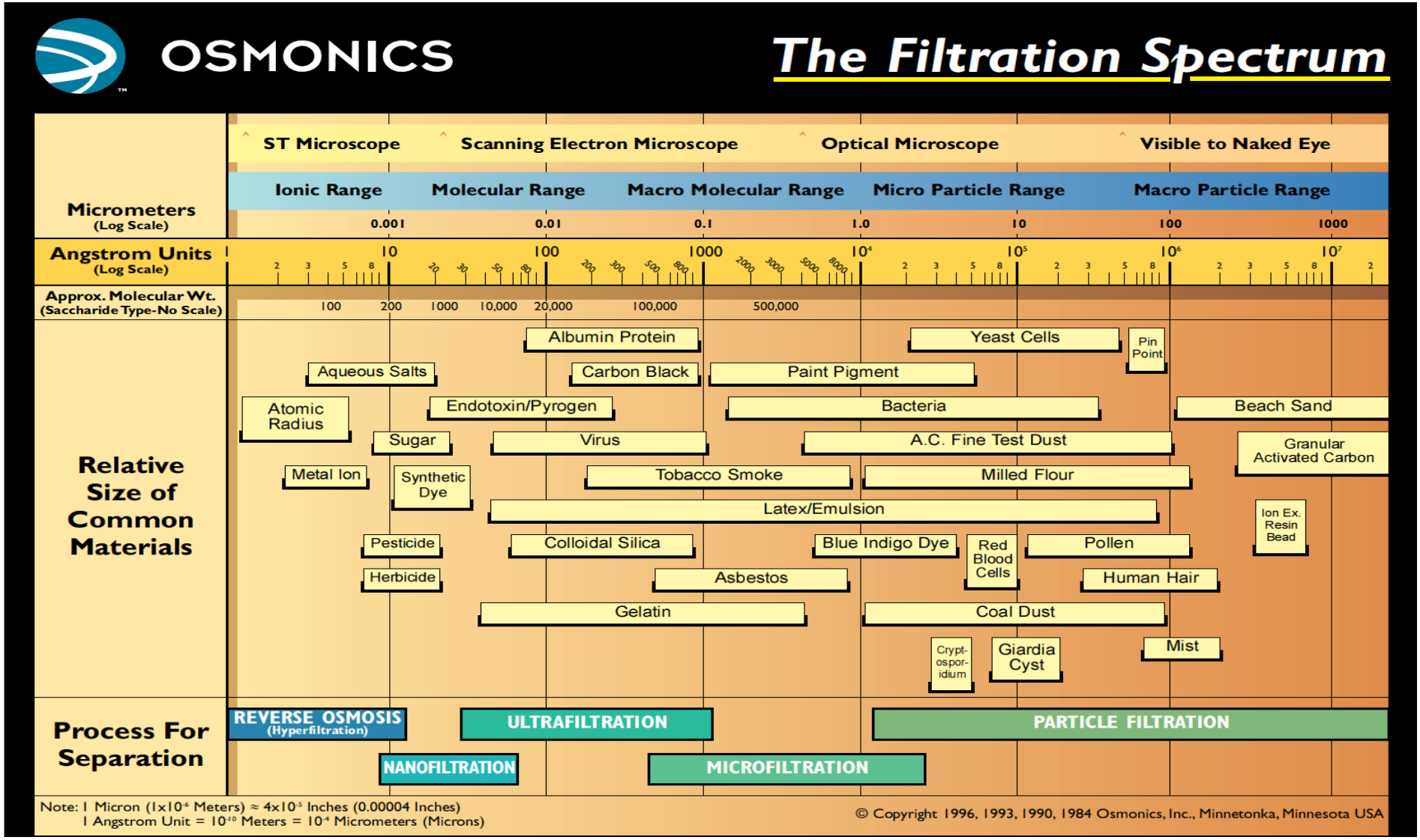
Filtration Spectrum



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