Contact:
Inrigo Water AS
LIV-bygget
7125 Vanvikan, Norway
Tlf.: +47 916 61 252
Fax: +47 748 53 701
Email: gaute@inrigowater.no

Multibore Ultrafiltration System for Drinking Water Treatment

Small footprint, Low cost, No fiber breaks

Fig. 1 Typical Norwegian surface water with high NOM concentration

The Demands

Natural Organic Matter (NOM) in Norwegian surface water is a major concern and should be removed from drinking water.

Sand filtration and Nano filtration are the most common drinking water treatment technologies in Norway. Sand filtration requires much bigger footprint and infrastructure investment than Nano filtration. Nano filtration has advantages of small footprint and compact design, however, serious membrane fouling, resulting continual flux reduction and high frequency chemical cleaning is torturing the plant operators.

Ultrafiltration (combined with coagulation) is an efficient approach to achieve high level NOM removal and maintain high filtration flux. Ultrafiltration plants have much small footprint and very low operation cost.

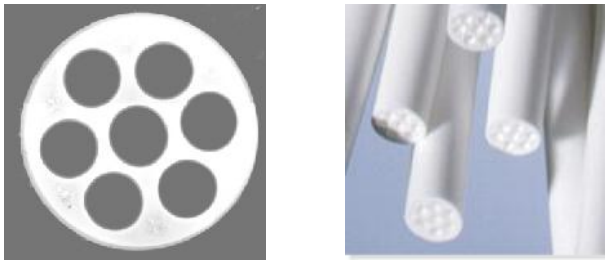

Fig. 2 Multibore ultrafiltration membrane fibers

Multibore ultrafiltration

Together with our partner, Inrigo water AS supplies Multibore ultrafiltration membrane system in Norway.

The patented Multibore membrane technology combines seven individual capillaries in a highly robust fiber – an arrangement that significantly increases the membrane's stability and eliminates the risk of fiber breakage.

The membrane provides a secure barrier against suspended solids, bacteria, viruses and other microorganisms and supplies a consistently high level of filtrate quality, even in cases where the composition of the original water varies.

Multibore benefits:

- 5 years warranty on fiber breaks
- Maximum operating safety
- Better economics – no fiber repairs, longer membrane life time

Multibore Ultrafiltration System for Drinking Water Treatment

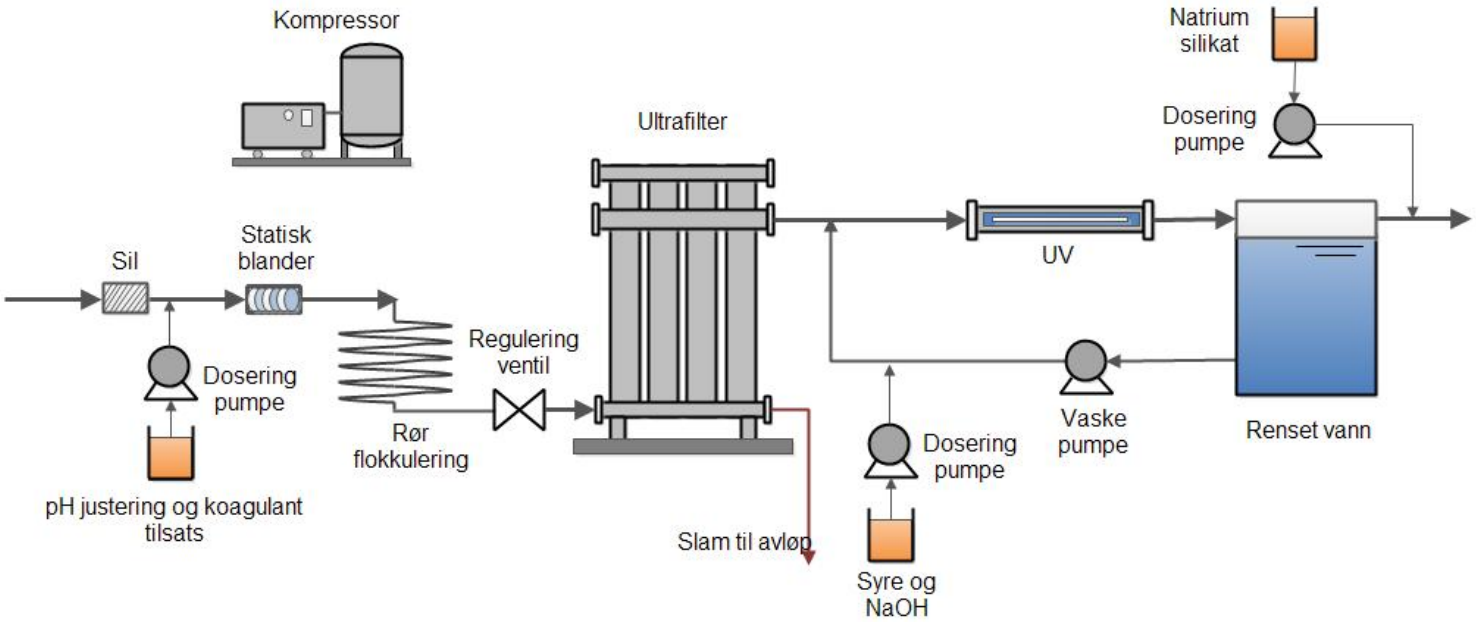

Fig. 3 Treatment scheme of multibore ultrafiltration plant

Advantages:

The Multibore fiber minimizes the probability of fiber breakage by combining 7 capillaries into one honeycomb shaped fiber.

- High mechanical strength
- Full automation
- Low investment/operation cost
- Small footprint
- Easy operation & maintenance

Fig. 4 Multibore ultrafiltration plant

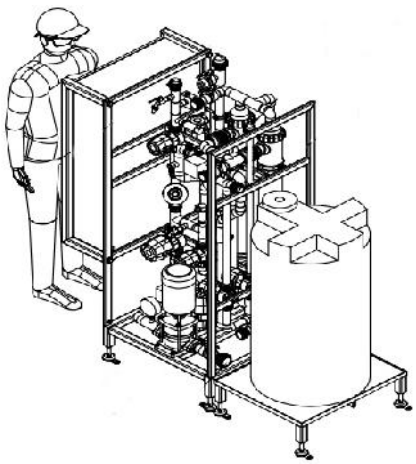

Fig. 5 Mobile Multibore ultrafiltration unit

Fig. 6 Multibore ultrafiltration membrane fibers and modules

Multibore Ultrafiltration System for Drinking Water Treatment

Technology discription:

Coagulation is the destabilization of colloidal/NOM particles. Before membrane filtration, coagulation and flocculation can increase the particle size, and then the flocs could be resisted and removed by ceramic microfiltration. Figure 8 shows the basic coagulation mechanisms.

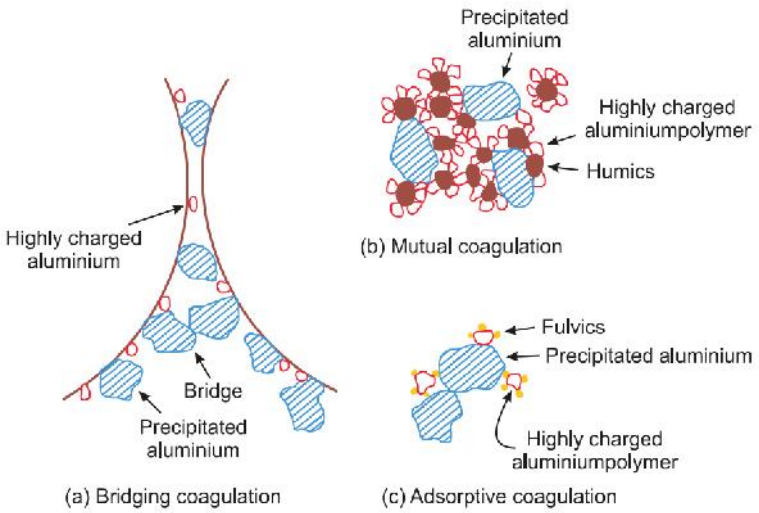

Fig. 7 Schematic of floc formation after coagulating NOM with aluminium salts

Multibore Ultrafiltration is a membrane separation process which has low filtration resistance, high permeate flux and minimum membrane fouling. Ultrafiltration with pore size 0.02 µ m could remove colloidal/NOM flocs, bacteria, and virus in the feed water. Coagulation and ultrafiltration processes provides the first hygiene barrier for the drinking water.

During ultrafiltration the purification of the feed water takes place. The pressurized feed water completely passes through the ultrafiltration membrane onto the filtrate side. Contaminants are rejected and accumulated on the inner side of the capillaries, forming a fouling layer. In order to remove the debris from the membrane and to maintain optimum operating conditions a periodical backwash is carried out.

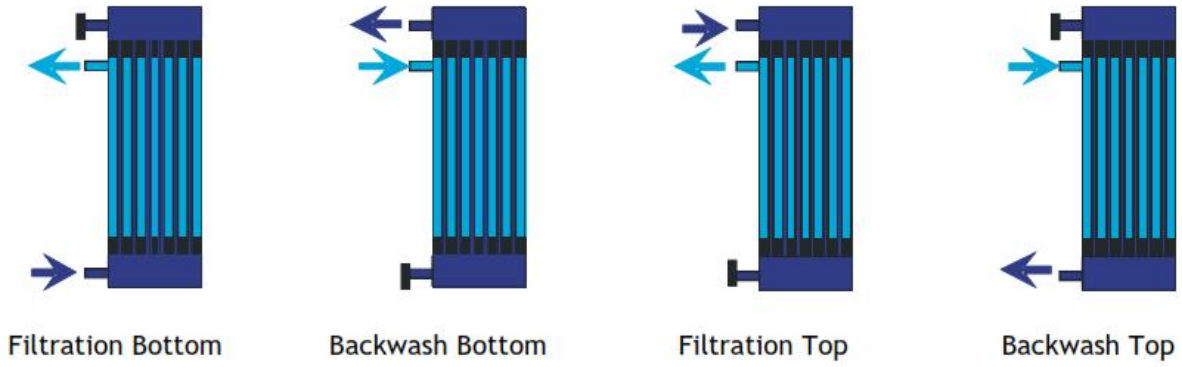

Fig. 8 Optimized operating cycle

A complete ultrafiltration operating cycle consists of different consecutive process steps (i.e. filtration, backwash) controlled by an automatically operating control system. The operating mode sequence depends mainly on the feed water parameters. For example, Fig. 8 shows the optimized inge operating cycle with alternating feed of the modules. The flow directions are alternated to expose the fiber equally.

UV disinfection is electromagnetic radiation in the short wavelength range of the spectrum from 5 to 400 nm, causes dieoff of microorganisms and leaves no residual radiation in a water. UV disinfection provides the second hydiene barrier of the drinking water.

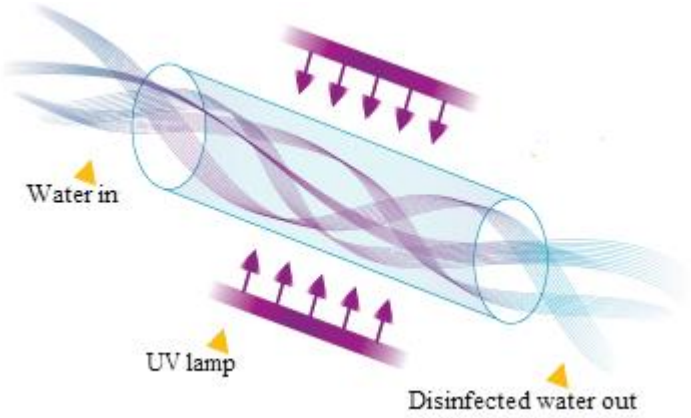

Fig. 9 UV disinfection

Corrosion control by adding water glass (sodium silicate) increases the water pH and creates protective coatings on pipes.

SMART WATER SOLOTIONS

Multibore ultrafiltration System for Drinking Water Treatment

Please Contact:
Inrigo Water AS
LIV-bygget
7125 Vanvikan, Norway
Tlf.: +47 916 61 252
Fax: +47 748 53 701
Email: gaute@inrigowater.no

More our services:

Design • Drinking water treatment plant • Wastewater treatment plant • Water reuse system • Package water/wastewater plant	Consult • Industrial water solution • Environmental assessment • Process optimization • Technology evaluation
Construction • 3D modeling • Strength calculation • Flow analysis • Production drawing package	Manufacturing • Welding • Water jet cutting • Assembly • Surface treatment