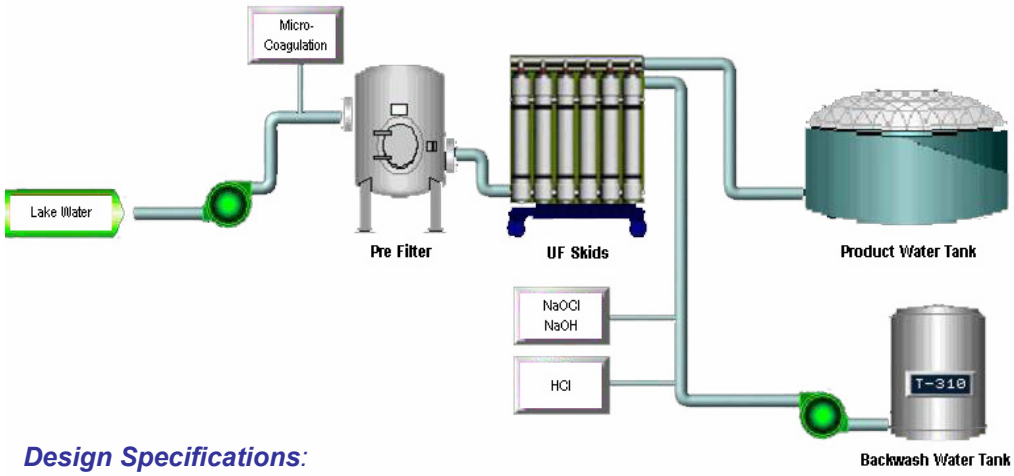
ENERSAVE UF Systems for Potable Water Application

Enersave has successfully designed, installed and operated a 2x5000m^3/d UF trial potable water treatment plant in Suzhou, China. The Taihu lake water is treated by UF directly, by eliminating clarification and conventional sand filtration. UF produced water having the quality of <0.1NTU turbidity and absolute removal of algae, Giardia cysts and Cryptosporidium oocysts ensures the residents potable water quality which meets the EU standard.

This trial project is conducted to study the workability and feasibility of Enersave Ultrafiltration (UF) system in potable water application. It has proven that Enersave UF technology is able to achieve potable drinking water quality in terms of *controlling pathogenic microorganisms and potentially carcinogenic Disinfection By-Products (DBP)* that meets the EU standard. Besides that, the UF system is simple to operate with automatic PLC and human interface control, utilizing minimal energy and chemicals which makes the UF system feasible to replace the conventional clarification and sand filtration water treatment systems.



***Design Specifications**:*

No. of UF modules/Skid: 60pcs/skid; Total Modules: 120pcs

Surface area/module: 40m^2/module

Design flux: 60～150L/m^2•hr

Operating flux: 100L/m^2•hr

Enersave's UF provides 250 times more surface area than conventional sand filters with thousands of hollow fibre membranes contained in UF modules. Typical UF flux rate is 70l/m^2, whereas conventional sand filters flux rate is 20m^3/m^2. High membrane surface area enables superior solids loading capability than sand filters. Enersave's UF absolutely removes suspended solids, algae, colloids, color bodies, and microorganisms from feed water with its fine pore size of 0.005~0.01micron.

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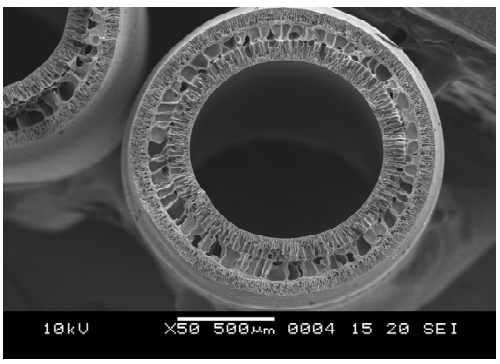
Enersave UF Systems – the solutions

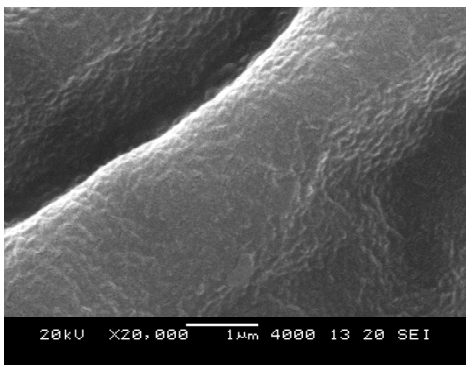
The existing clarification and sand filtration system was unable to cope with the turbidity fluctuation of Taihu lake water from 10 ~ 500 NTU. By using Enersave UF system, the potable water consistently achieve <0.1 NTU of turbidity regardless of lake water fluctuation.

Due to the surrounding agricultural and industrial activities, the lake is threatened with blue algae bloom especially in summer time. The existing clarifier was unable to remove the neutral-charged algae, even with the aid of flocculation. The subsequent sand filter was quickly clogged up by the high algae load. Frequent backwashing of the sand filter reduced the potable water production. Enersave's UF membranes' high surface area enables superior acceptability to the surge of algae mass, without reducing normal backwash intervals and ensuring continuous normal water production. In addition to that, due to the trapping of algae within the sand media, higher pressure is applied to push water through higher differential pressure which inevitably carries the algae over to the distribution pipelines. The decaying algae in the pipelines will cause odour, toxins and unpleasant taste. UF's absolute removal of algae eliminates this concern.

The removal efficiency of UF on various parameters are:

Parameters	Feed	Permeate	% Removal
Turbidity, NTU	10 ~ 500	Trace < 0.1	100
COD_{Mn}, mg/l	2 ~ 7.5	1.5 ~ 3.5	26 ~ 50
NH_4-N, mg/l	0.07 ~ 0.18	< 0.1	45 ~ 75
Total Fe, mg/l	0.3 ~ 2.7	< 0.1	> 90
Total Bacteria, CFU/ml	100 ~ 9000	< 1	100
Coliform Bacteria, MPA/100ml	200 ~ 3000	N/D	100





Microscopic view of UF membranes indicates the pore size at 0.005~0.01micron.

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Sales Contact:

ENERSAVE GROUP

Websites: www.enersave-group.com, www.enersave.com.my