SuisseMed™
Technologies
www.SuisseMT.com

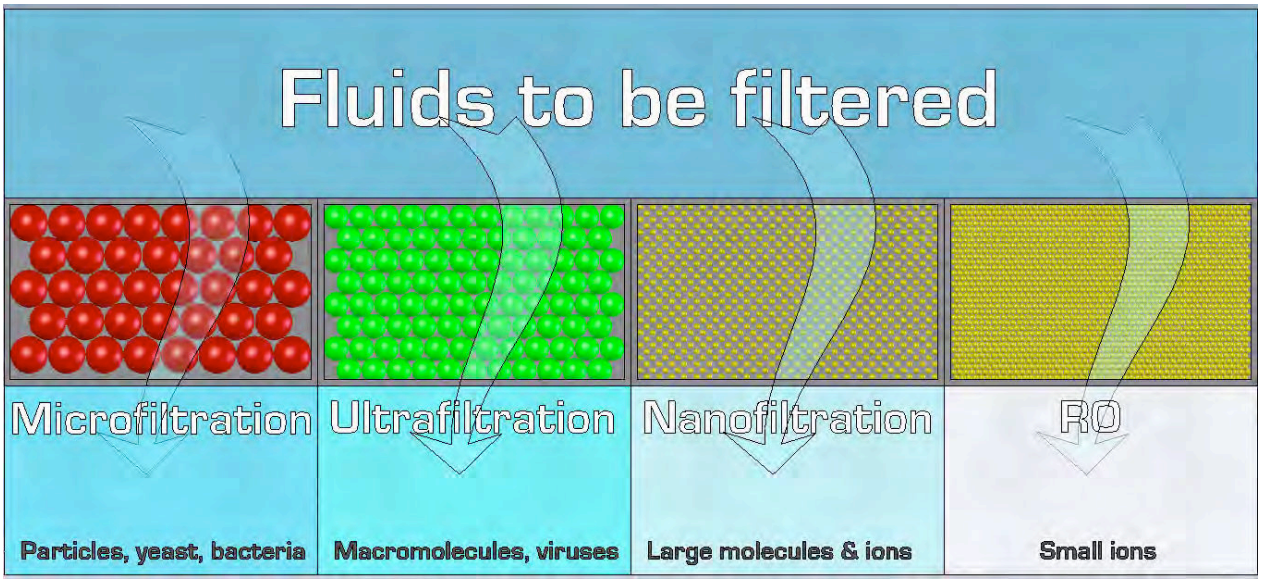
WFS

Water Filtration System

Water Filtration: Fibres & Systems

Membrane Separation Technologies

Filtration (or membrane separation) may be grouped into 4 classes depending on the pore size of the membrane or particles size to be removed and depending on the needed applied pressures. By ascending order of filtration (or pressure used): microfiltration, ultrafiltration, nanofiltration and reverse osmosis.



Microfiltration with pore size larger than 50 nm is used to separate particles (including yeast and bacteria) between 20 -1000 nm using pressures varying between 0.02-0.02 MPa.
Two techniques may be used depending on the particle concentrations in the fluids: for low concentration dead-end flow is used while for higher concentrations the cross-flow technique is used avoiding (calking) back flushing.

Ultrafiltration with pore size ranging from 1 – 100 nm is used to separate macromolecules, colloids including viruses, and is pressure driven

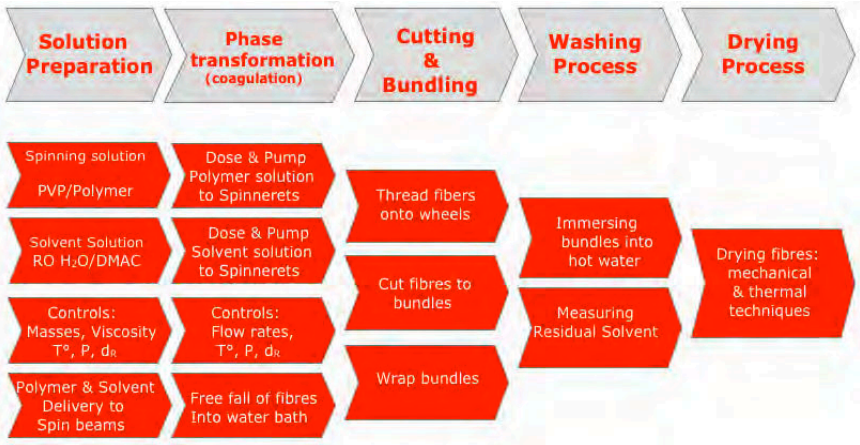
Nanofiltration with pore size of less than 1 nm is a precursor to RO to remove large molecules and where pressure is still more elevated.

RO is the finest filtration step and is ion-specific (compact pore morphology) removing solutes with Mwt < 200 and operating pressures up to 100 bars.

Fibre Formation

While the process of producing hollow fibres is simple, the theoretical basis is complex to treat. Often It is closer to an art than to engineering.

The process is shown in this flow diagram specific to hollow fibres for water filtration

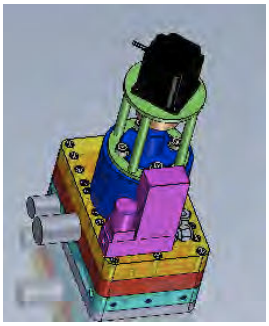


The Technology

Phase inversion is the main technique used to produce hollow fibres. When the tertiary system hits the surface of the coagulation vessel it condenses and the fibres are formed. A number of parameters (design, spinnerets etc.. determine the morphology of the fibres and their performance.

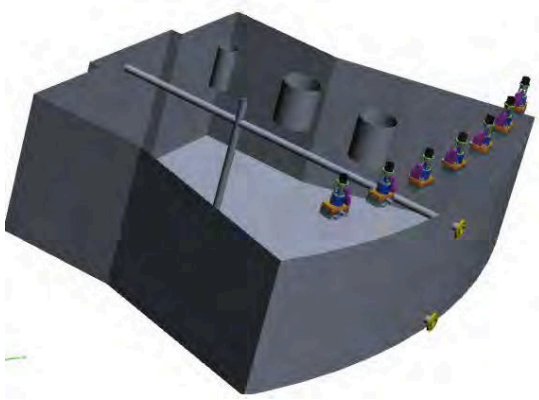
Polymer solutions have prepared under strict conditions and injected into the spinnerets (P, T & η) insuring constant flow

The ratios of the solvents used in the bore liquid are critical, and hence have to be controlled at all times.

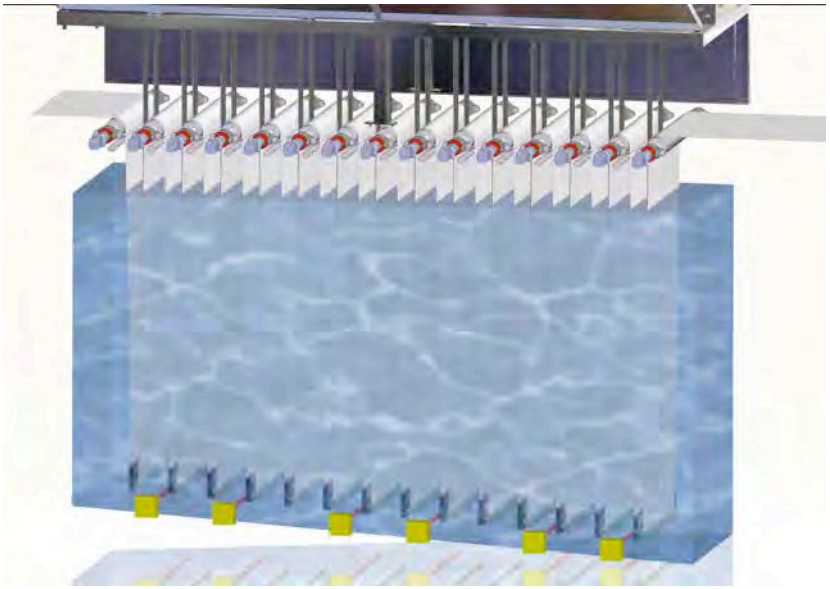


The polymer solution is filtered down to 5 μ just before injecting it into the spinpacks. The polymer solution is fed at constant temperature, pressure and flow. The polymer solution flow distribution is critical in insuring well formed fibres. Fibre morphology is determined by the air gap and the ratio of the solvents used

The consolidation of the fibres continue in the Phase inversion vessel that gives the fibre its final characteristics and removes excess of unreacted polymers.

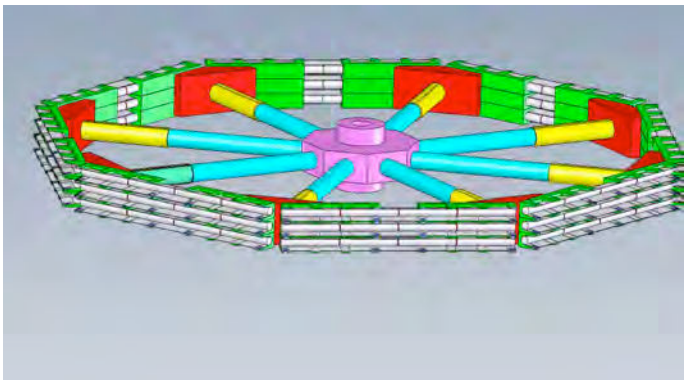


Excess Solvent is removed from the fibres through thorough washing at elevated temperatures



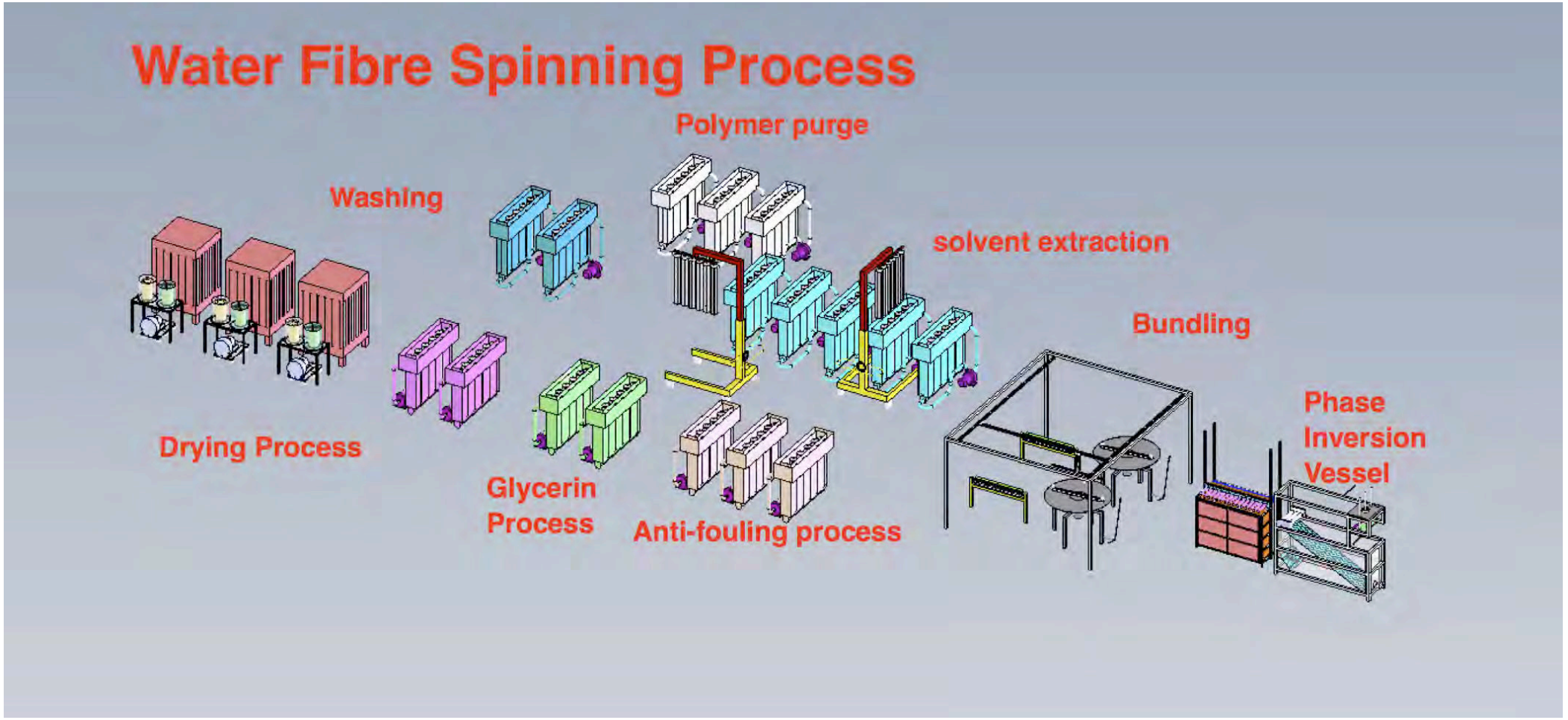
Washed out fibres are then dried to the required level after insuring that pores will not close due to heating.

Dried fibres are wound on a wheel and cut to the desired length after adding a protection film to be removed when making up the filter



SuisseMed™ Technologies

Rue du Rhône 5, CH 1920 Martigny, Switzerland
T:+41 27 270 6161
www.suissemt.com



SuisseMed™ Technologies

Rue du Rhône, 5
CH-1920 Martigny, Switzerland
T: +41 78 928 0000
www.suisseMT.com