

## Membrane configuration

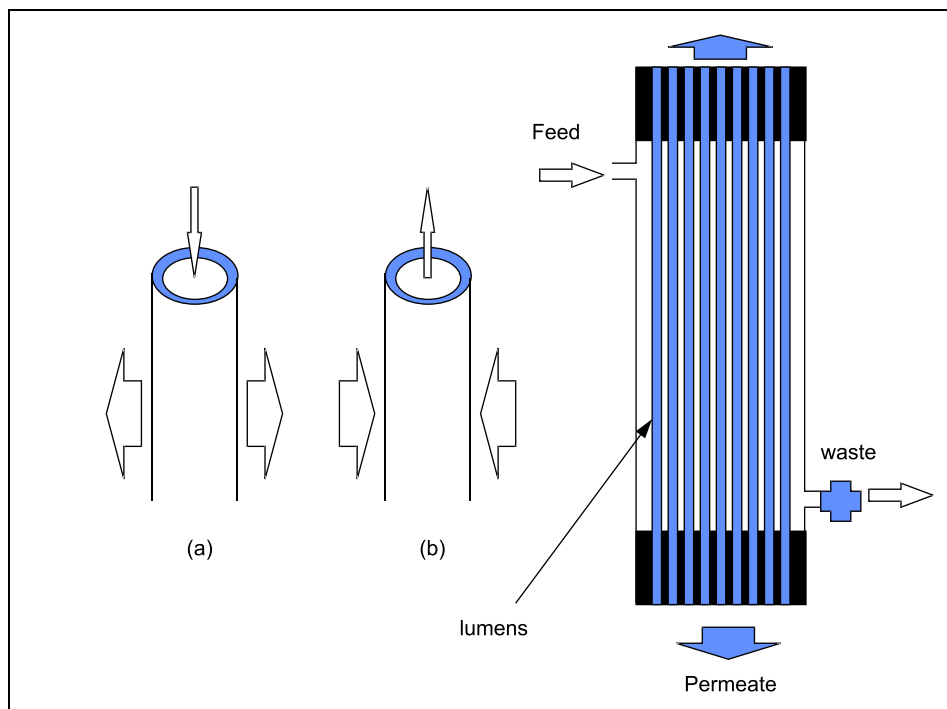
This refers to the packing of the membrane in the module so that it can be installed in the system. Common configurations include:

Plate and frame  
Tubular  
Spirally wound  
Hollow fine fibre  
Submerged membrane systems

Plate and frame and tubular membrane are not commonly used for municipal water treatment but are more appropriate for certain waste or food processing applications where there is a high fouling tendency. Spirally wound (SW) and hollow fibre (HF) are distinctly differing designs which allow a high packing density of membrane per membrane module.

## Hollow fibre module

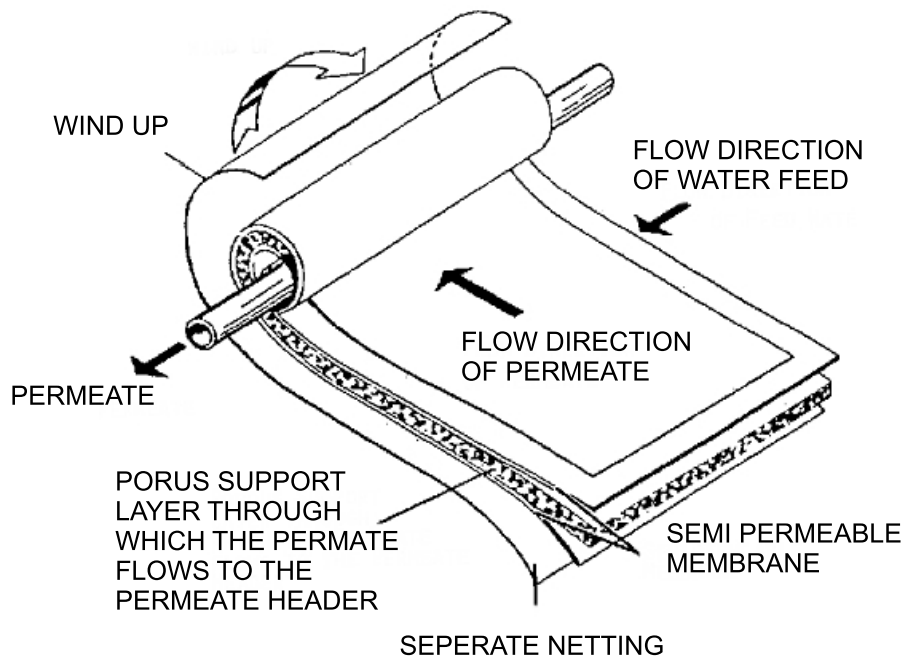
The hollow fibre configuration describes membranes which are cast as fine tubes or lumens (see diagram). The feed can be applied to the inside or outside of the lumen, according to the particular manufacturer's design. The schematic illustration below shows hollow fibre membrane lumens and module configured in cross flow; (a) feed to inside of lumen; (b) feed to outside of lumen.



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## ***Spirally wound module***

Spirally wound modules are constructed from flat sheets of membrane glued back to back on three sides forming an envelope around a porous support material. The open end of the membrane envelope is attached around a tube with holes which provide a route for permeate to flow out. The membrane is wound up around the centre tube to form a cylindrical element. Water that has passed through the membrane in service flows towards the centre tube through the porous support. The rolled up membrane leaves are separated by a vexas mesh spacer, which also serves to promote turbulence in the feed channels. These membrane modules are chiefly designed for cross flow use, with the feed stream running mostly parallel to the membrane surface.



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