micro-membranesystems
9 Cork Terrace
Bath
United Kingdom
BA1 3BE
Tel: +44 (0)1225 444512
Fax: +44 (0)1225 461060
Email: info@micromembrane.co.uk

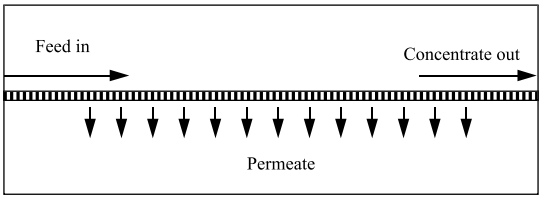
Basic definitions

Flux and Permeability

Flux defines the flow of permeate per unit area of membrane [m/s, $m^3/m^2.s$, $l/m^2.h$].
Permeability is sometimes described as flux per unit pressure [m/s bar, l/m^2h bar, m/s kPa].

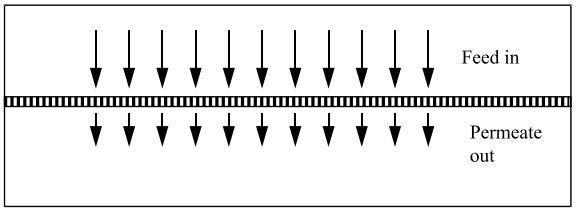
Cross-flow filtration

In water treatment, all reverse osmosis and nanofiltration systems are configured as 'cross flow' processes whereby a proportion of the feed is converted to permeate, and a proportion exits the system as concentrate or retentate, which in theory contains the rejected material. The proportion of feed water converted to product defines the **system recovery**, which can be expressed as a ratio or percentage. The term '**delta P**' is often used to describe the pressure differential in the feed to concentrate stream. Increased Delta P is a key indicator of membrane fouling.



Dead-end filtration

Many micro- and ultrafiltration processes are configured 'dead ended' in which 100% of the feed is converted to permeate during production time. The separated material deposits on the membrane surface and the membrane steadily becomes blinded causing a loss of flux. In order to maintain production, the dead-end filter is periodically backwashed to waste between successive production cycles. In such processes the **transmembrane pressure (TMP**) describes the pressure differential from feed to permeate. Increased TMP is a key indicator of membrane fouling in these applications



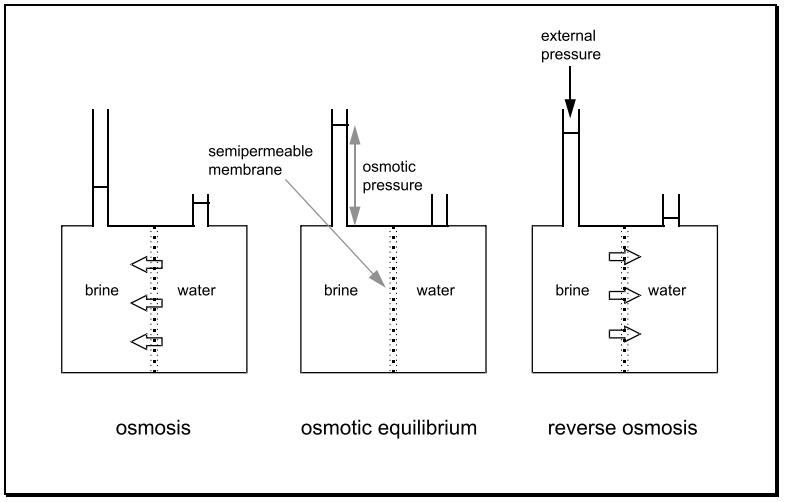
Micro-Membrane Systems Ltd. Registered in England and Wales No: 4915635.
Registered Office: 9 Cork Terrace, Bath, United Kingdom BA1 3BE

micro-membranesystems
9 Cork Terrace
Bath
United Kingdom
BA1 3BE
Tel: +44 (0)1225 444512
Fax: +44 (0)1225 461060
Email: info@micromembrane.co.uk

Osmosis and reverse osmosis

Osmosis is a natural phenomenon which describes the movement of water containing solute across a semi-permeable membrane from a dilute solution into a more concentrated one. In this context the semi-permeable membrane is permeable to water, but not to solute, i.e. dissolved salt. It is driven by the osmotic pressure differential across the membrane.

Reverse osmosis describes the condition where an external pressure is applied, which exceeds the solution osmotic pressure causing a reversal of the flow through the membrane as indicated below. In this way, the RO membrane acts to separate the salt from the water.



Micro-Membrane Systems Ltd. Registered in England and Wales No: 4915635.
Registered Office: 9 Cork Terrace, Bath, United Kingdom BA1 3BE