

# MEMBRANE TECHNOLOGY

## DESCRIPTION

Membrane technology is the generic term used for any separation process in which membranes are employed. A membrane can be defined as a physical barrier separating two phases and allowing a selective transition of compounds from one phase to the other. The part that goes through the membrane is the permeate and the part that is rejected by the membrane is the retentate (Figure 1).

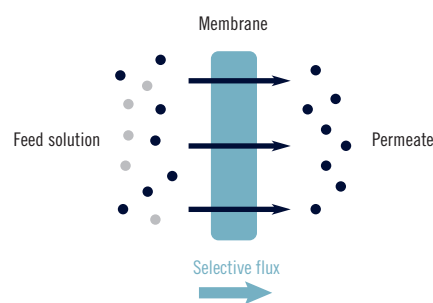


Figure 1. Membrane technology separation scheme.

Membrane technology can be applied for purposes such as:

- **Water purification:** undesired impurities are removed from the solution. For example: soft water production by removal of calcium and magnesium cations
- **Concentration:** required components are present at a low concentration and the solvent is removed. For example: concentrating fruit juice by removing water
- **Fractionation:** a mixture must be separated into two or more desired components. For example: milk fractionation in the dairy industry

Membranes can be classified depending on the compounds that membranes are able to separate (Figure 2).

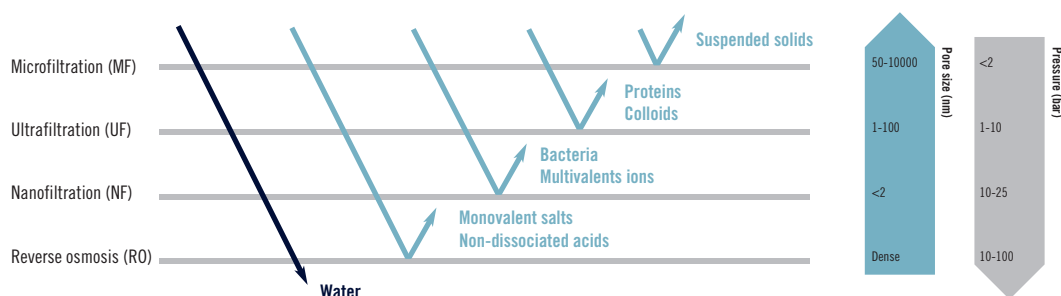


Figure 2. Pressure driven membranes.

# scientific & technical offer

## IMDEA-WATER SOLUTIONS

IMDEA-Water Institute has wide-ranging expertise in scientific consulting. Our membrane technology unit has a multidisciplinary team focused on:

- Evaluating membrane process performance, both at laboratory and pilot level. IMDEA Water Institute owns a broad range of state-of-the-art equipment for studying microfiltration, ultrafiltration, nanofiltration and reverse osmosis membranes
- Preparation of new, next generation membranes
- Membrane fouling characterization (membrane autopsy).
- Membrane recycling. IMDEA Water Institute is currently carrying out a demonstration European project (LIFE13 ENV/ES/000751, TRANSFOMEM).



## IMPLEMENTATION SECTOR

- Chemical industry (fine chemicals, fertilizer industry, paint industry)
- Pulp and paper industry (water production process and wastewater treatment)
- Agricultural sector (starch production industry, desalination for irrigation)
- Food industry (juice production, wine production, dairy industry)
- Drinking water production (sea and brackish water desalination)
- Wastewater treatment plants (water reclamation for further reuse)
- Membrane manufacturers (improvement of membrane performance)
- Membrane fouling monitoring companies (membrane autopsy and cleaning procedures)

## ADDITIONAL INFORMATION

<http://www.agua.imdea.org/investigacion/proyectos-de-investigacion/tecnologia-de-membranas>

<http://www.life-transfomem.eu/>

## TECHNOLOGY KEYWORDS

Membrane; water purification; recycling

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