

The Background

Modern production methods and environmental technologies increasingly require the use of pure demineralised water, and demands on water quality are increasing with advancing technology, economic requirements and legal obligations.

Kalsep's range of reverse osmosis systems provides an intelligent environmental and cost effective water purification solution to assist in

- increasing product quality
- reducing production costs
- environmental improvements
- reducing chemical usage
- desalination
- waste water recovery and recycling

Systems are available from small 20l/hr industrial units to larger turnkey industrial and municipal installations.

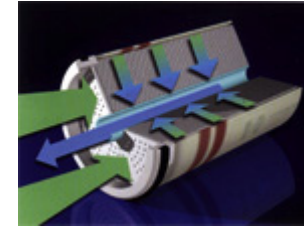
The Principle

Reverse osmosis utilises a membrane to remove dissolved salts from the feed stream. If a pressure higher than the osmotic pressure is applied to a feed water on the concentrate side of a membrane, a reverse osmotic flow results in water being forced through the membrane, with the dissolved salts retained in the concentrate stream.

The Technology

Kalsep's reverse osmosis systems utilise thin-film wound composite membranes, characterised by a remarkably high rejection rate. The high surface resistance of

these membranes ensures a long life cycle with the resulting benefits of reduced operating costs, even with a high solids concentration in the feed water. High permeate flow rate is achieved by recirculation of the internal system concentrate, and where maximum recovery is required, two or more modules can be connected in series to ensure that economical purified water production is achieved. Each down line module receives the concentrate of the previous module, and by comparison to the parallel operation of conventional systems offers several advantages, including



- maximum product water per module
- minimum concentrate (waste) flow
- lower power consumption
- maximum efficiency (in cost/m³)

Design

Individual applications set different demands on design and performance requirements. Kalsep systems designs are based around practical, standardised system components which allow standard designs to be tailored to customer requirements. This enables a customer orientated solution to be provided with the assurance of a reliable operating system as well as efficient and cost effective production.

Depending on flow rate required, wall mounted units can be supplied to minimise space requirements and supply up to 400 litres per hour, with larger skid mounted units providing the higher flow rates required.

High Performance, Low Energy

Developments in membrane technology over recent years have led to the development of modules which provide high permeate flow rates even at relatively low pressures, and are now firmly established in practical applications. Reverse osmosis units from Kalsep are fitted with the low energy, high performance wound modules of this type offering a comprehensive range of flows, with associated energy savings of up to 30%.

Plant Management

State of the art control systems are used to manage the entire plant ensuring trouble free operation of the whole system, and providing monitoring information for the operator.

The Benefits

- Wide product range
- High flux
- High salt rejection
- Reduction in fouling rate
- Proven systems design and installation
- Customised solutions
- Full after sales support and servicing
- Full range of pretreatment options including Ultrafiltration and Fibrotex™

The Applications



Typical RO Installation of a brine waste water

- Industrial water treatment
- Boiler feed water treatment - demineralisation
- Waste water treatment
- Semiconductor applications
- Sea water desalination
- Surface water treatment
- Ground water treatment
- Process applications