



# REMOVE SPECIFIC IONS FROM A WATER SOURCE OR REMOVE ALL THE DISSOLVED MINERALS AND SALTS

Water Efficient

Chemical Efficient

Suitable for a wide range of flows

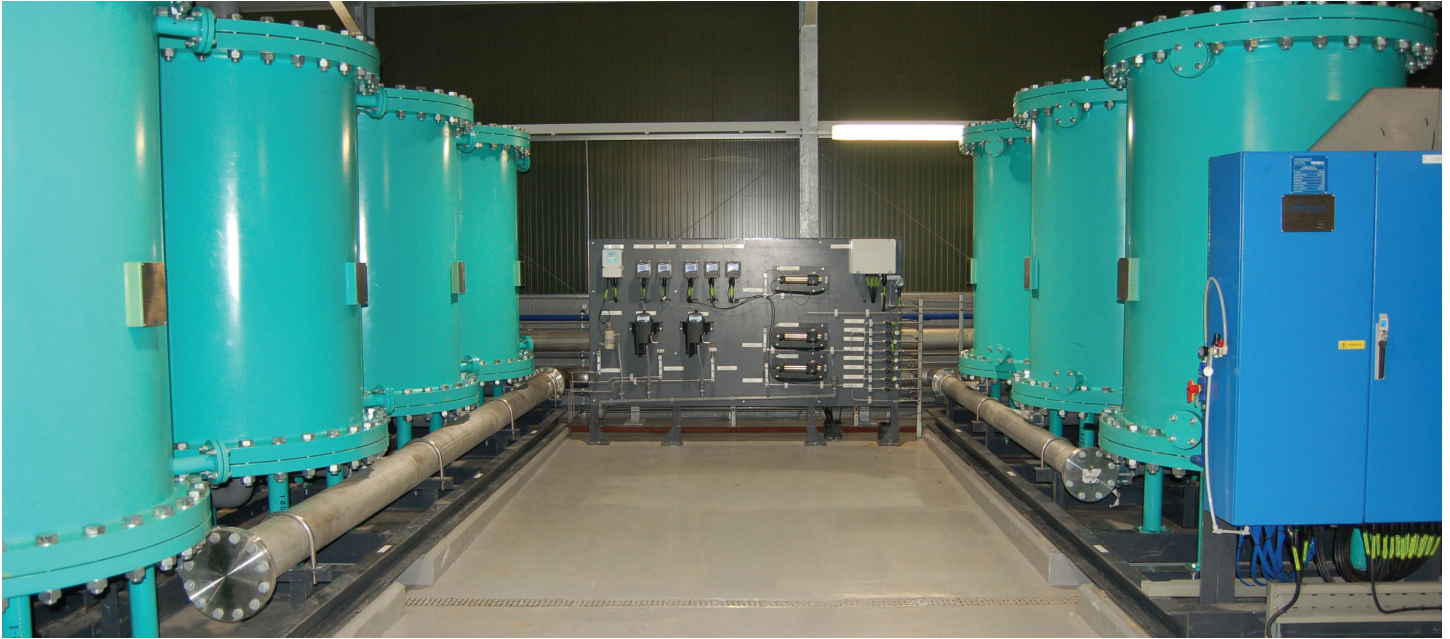
Selective removal of contaminants



Custom engineered  
designs and a variety  
of resins for different  
water sources

## ION EXCHANGE TECHNOLOGY





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Ion exchange is used in a huge range of applications from power generation, petrochemicals, steel/aluminium manufacture, food and beverage, electronics, pharmaceuticals, metal finishing and paper manufacture. Some of these applications require the removal of specific dissolved ions from a water source, others the removal of all the dissolved minerals and salts.

A typical raw water will contain a variety of cations such as calcium, magnesium and sodium as well as anions such as sulphate, chloride, alkalinity and nitrate. Dependant on the downstream application these minerals can require removal from the water.

Ion exchange resins work by exchanging dissolved charged impurities, for other ions. In the case of a water softener calcium and magnesium are taken on to the resin and exchanged for sodium. When the resin becomes exhausted and can no longer remove calcium the resin vessel is taken out of service and regenerated by passing sodium chloride (salt) solution through the vessel. The calcium and magnesium on the resin are exchanged for the sodium in the regeneration stream and pass out to waste. Once rinsed the cycle repeats.

Other applications such as high pressure boiler feed water require all of the dissolved ions, to be removed from the water to prevent scale formation or corrosion in the boiler system. In this case a combination of cation and anion removal resins are used. The cations are exchanged for hydrogen ions ( $H^+$ ) and the anions for hydroxide ions ( $OH^-$ ) when combined they form water ( $H_2O$ ).

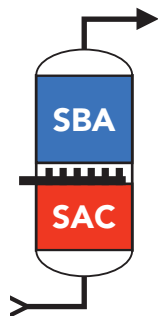
As an engineering company Ovivo can provide various designs of ion exchange vessels including back-washable, packed bed and mixed bed in a variety of regeneration configurations including co-flow, split-flow, reverse-flow and external regeneration.

Ovivo provide both ion exchange and membrane based water treatment plants that can be combined as appropriate to the customers' requirements. For example water softeners are often used in front of reverse osmosis membranes to prevent scale formation on the membranes and allow operation of electrodeionisation plants at higher water efficiencies. Similarly ion exchange can be used after reverse osmosis membranes to remove the residual dissolved ions. Further details of our membrane based technologies can be found on our website and in our membrane brochure.



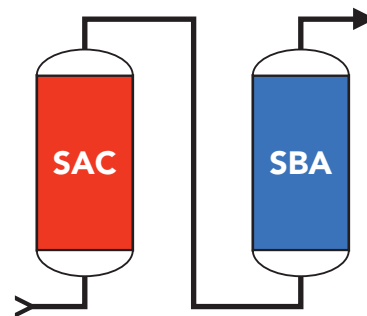
## TYPICAL ION EXCHANGE ARRANGEMENTS

CUSTOM ENGINEERED TO CLIENT SPECIFICATIONS OR PACKAGE PLANT.



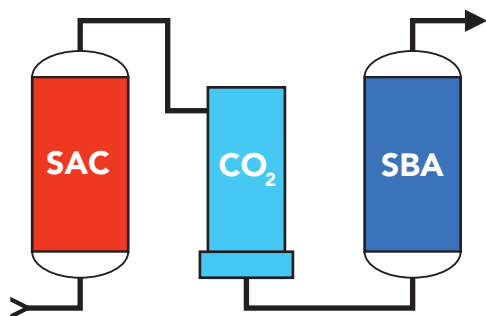
### Twin compartment cation anion - polishing

Suitable for low TDS feed or polishing applications.  
Small footprint using lined steel vessels.



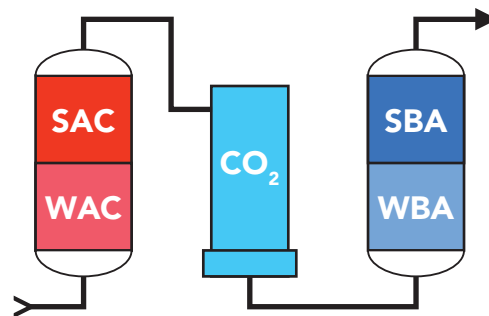
### Separate bed cation anion – low alkalinity

Suitable for higher TDS feed waters requires polishing for high purity applications. Can use GRP pressure vessels as a low cost solution.



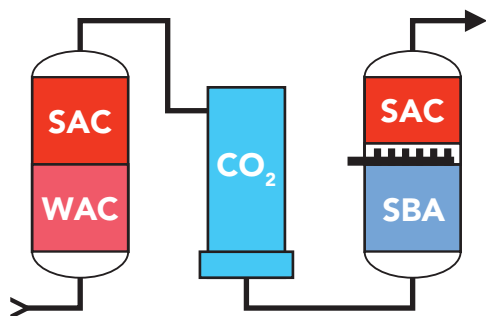
### Cation degasser anion – High alkalinity water

Suitable for higher TDS feed water with elevated levels of alkalinity. Can be lined Steel vessels or GRP.



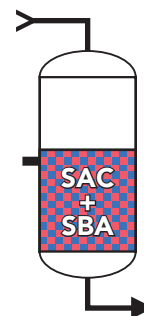
### Weak and Strong resins – chemical efficiency

Suitable for water with high temporary hardness / high TDS feed waters. Lined Steel vessels. Or 4 separate GRP vessels one for each type of resin.



### Cation degasser anion with cation polisher

Suitable for water with high temporary hardness. Polishing only required for cations saving a polishing vessel



### Mixed bed internal regeneration

Suitable for low TDS feed such as process condensates and polishing after separate bed cation / anion. Can be internally or externally regenerated.



# ION EXCHANGE TECHNOLOGY BENEFITS

## HOW WE CREATE VALUE

Optimised designs to meet your requirements:

- Wide choice of resins
- Vessel arrangement
- Chemical Efficiency
- Minimised Waste Water
- Specification Compliant
- Package Plant
- Wide range of design codes and materials of construction

Custom engineered to client specifications or package plant.

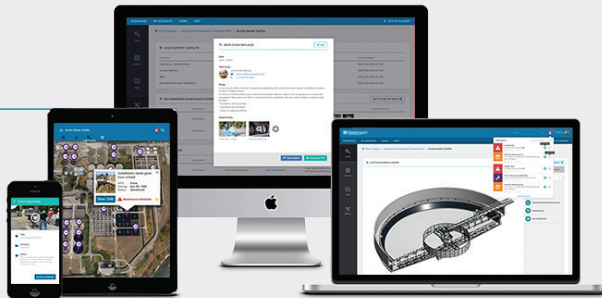
Variety of resins & designs for different water sources



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