

WATER TREATMENT

Applications for industrial and potable water

CHEMRA offers a large portfolio of ion exchange resins for water treatment, serving residential applications, demineralisation plants for boiler make-up, process water, and cleaning waste water for disposal or reuse.

Residential tap water (POE - Point of Entry, POU - Point of Use) are the most basic and commodity applications.

Industrial demineralisation has more demanding specifications. The variety of water compositions and system designs requires a large number of resins.

The production of ultrapure water is the most exigent treatment, requiring top quality and high-performance resins in terms of TOC and heavy metals release.

Waste water and ground water treatment are more and more critical and require often highly selective ion exchange resins and adsorbents to remove the most critical toxic pollutants. CHEMRA is serving the market with innovative and efficient solutions for toxic metals or organic contaminants.

CHEMRA offers two grades of ion exchange resins:

- TREVERLITE products are standard grade resins with Gaussian distribution.
- TREVERJET products are high performance grade resins with uniform particle size.

Typical Applications

- Water softening and dealkalisation
- Water demineralisation
- Condensate polishing plants
- Ultrapure water
- Waste water



WATER SOFTENING AND DEALKALISATION

Residential or industrial water softening with strong acid cation resins in the sodium form are the most common applications in water treatment. CHEMRA offers different grades of resins for best performance and cost saving in softening units.

Partial softening, or dealkalisation, of water is performed on weak acid cation resins.

We are supplying preconditioned food grade ion exchange resins for potable water applications.

WATER DEMINERALISATION

CHEMRA provides a large portfolio of resins for demineralisation plants. Their specifications will be selected in accordance with each specific application:

- Polystyrenic or acrylic matrix,
- gel or macroporous structure,
- Gaussian (TREVERLITE) or uniform (TREVERJET) particle size,
- different capacities,
- different ionic forms of strong acid cation, weak acid cation, strong base anion, and weak base anion respectively.

For the production of pure water in the polishing step, CHEMRA supplies different mixed bed resins including ultrapure water grades for high demanding applications.

In case of surface water, specific scavenging resins for the removal of organics have been developed. They are based on different type of polymers, such as polyacrylate or polystyrene depending on the origin and nature of the organic molecule to be removed.

CONDENSATE POLISHING PLANTS

Most power plants require a high water quality, essential for long and stable equipment operation, without corrosion or the deposit of scale.

A specific range of high performance resins have been developed for the removal of trace ions from condensate before recycling the water back to the boilers. Condensate polishing plants are generally operating at high flow rate, high temperature and most of the time an external regeneration requiring higher resistant ion exchange resins.

Depending on the conditions CHEMRA is offering a full range of uniform resins from the TREVERJET range either as gel type or macroporous.



ULTRAPURE WATER

Ultrapure water (UPW), water for injection (WFI), high-purity water and deionized (DI) are all terms describing basically the same property. They refer to water which has been purified to the highest standards by removing all contaminants such as

- organic and inorganic compounds,
- dissolved and particulate matter,
- volatile and non-volatile,
- reactive and inert,
- hydrophilic and hydrophobic and
- dissolved gases.

And producing UPW is a challenge.

CHEMRA is introducing a variety of UPW resins and ready to use mixed beds to purify water to the highest standards possible (18+ megohm and ppt level of contaminants). These resins can be used either separately in large operating units or in ready to use mixed bed filters on industrial and laboratory scale. Depending on the usage of ultrapure water, different grades of resins are available. For TOC removal CHEMRA is offering specific synthetic activated carbons.

WASTE WATER

Industries are disposing their liquid waste streams into the environment under strict regulations. CHEMRA is providing its expertise and a large choice of different resins to remove, recover or recycle different contaminants from waste streams such as:

- heavy metals on chelating resins,
- nitrates on specific anionic resins,
- organics (such as phenols, VOC, PFAS, ...) on adsorbents or anionic resins,
- VOCs on carbonaceous resins,
- and many more.

The list of contaminants which can be removed or recycled with CHEMRA products is long.

Soil remediation may involve water extraction and its depollution. Most of ionic or non-ionic contaminants can be efficiently removed by ion exchange resins, chelating resins or adsorbents. In some cases, synthetic carbonaceous adsorbents can even replace or be added to activated carbon.

In contrast to activated carbon, resins can be regenerated multiple times on-site and can reduce waste significantly or allow the recycling of these pollutants.



Selection of typical resins for water applications

Ion exchange resins and adsorbents can be very specific. The following table provides a short overview of the major classes of ion exchange resins. More specific ion exchange resins, chelating resins and adsorbents can be provided on request.

Resin	Type	Specification
Organic Scavenger		
TREVERLITE SCA200	SBA	Strong base, MR, acrylate, Gaussian, for high organic load
TREVERLITE SCA300	SBA	Strong base, MR, polystyrenic, Gaussian, for tannic acids and polishing
DEMINERALISATION		
TREVERJET IXC1200/Na	SAC	Strong acid, gel, uniform, cap > 2,0 eq/L, Na ⁺ form (exist also in H ⁺ form)
TREVERJET IXA6200/FB	WBA	Weak base, MR, uniform, cap > 1,4 eq/L
TREVERJET IXA1000/Cl	SBA	Strong base type 1, gel, uniform, cap > 1,30 eq/L, Cl ⁻ form (exist also in OH ⁻ form)
TREVERJET IXA2000/Cl	SBA	Strong base type 2, gel, uniform, cap > 1,30 eq/L, Cl ⁻ form (exist also in OH ⁻ form)
TREVERJET IXA3000/Cl	SBA	Strong base type 1, MR, uniform, cap > 1,10 eq/L, Cl ⁻ form (exist also in OH ⁻ form)
TREVERLITE MB200	MB	Mixed bed SAC H ⁺ and SBA OH ⁻ ionically balanced, regenerable
ULTRAPURE WATER		
TREVERJET UPM4100	MB	Mixed bed SAC H ⁺ and SBA OH ⁻ ionically balanced, single use for the polishing of high quality UPW
WASTE WATER		
TREVERLITE XS133100	SBA	Strong base, MR, Gaussian, for PFAS removal in waste water
TREVERLITE CHE710/Na	CHE	Weak acid with IDA chelating group for heavy metals removal (Cu ²⁺ , Hg ²⁺ , Ni ⁺ , Zn ²⁺ , ...)
TREVERLITE CHE730/H	CHE	Weak acid with thiol chelating group for heavy metals removal (Hg ²⁺ , Ag ⁺ , Cu ²⁺ , Pb ²⁺ , Cd ²⁺ , ...)
POTABLE WATER		
TREVERLITE IXC310/H	WAC	Weak acid, MR, acrylate, Gaussian, cap > 4,3 eq/L, for partial softening of drinking water
TREVERJET IXC1110/Na	SAC	Strong acid, gel, uniform, cap > 1,9 eq/L, for softening of drinking grade
TREVERLITE IXA810/Cl	SBA	Strong base, MR, selective resin for nitrate removal
TREVERLITE XS130800	SBA	Strong base, gel, functional group for PFAS removal



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Safety

Polymeric resins can swell significantly between the aqueous and pure solvent phases or when rewetted. Care should be taken. Glass columns and even steel columns can break. Wear glasses when using resin systems. To avoid high pressure build up an operation in counter-current or up-flow through the polymer bed shall be considered. Please check also the corresponding MSDS for detailed information.



For the address of your nearest local sales office please visit our website.

Ion exchange polymers and adsorbents are generally of industrial grade and impure except otherwise stated by CHEMRA™. Chemicals and gases must be handled with care and by trained personal, regulatory requirements and safety standards must be met. Oxidative chemicals like nitric acid or peroxides can be explosive in combination with ion exchange polymers and adsorbents, others can be corrosive. Rewetted dry polymers develop heat and expand significantly. CHEMRA makes no warranties either expressed or implied as to the accuracy or appropriateness of this information and technical advice – whether given verbal, in writing or by way of trials – is given in good faith and expressly excludes any liability upon CHEMRA arising out of its use. Our recommendations cannot be seen as recommending the use of the product in violation of any patent or license. We recommend that the prospective users determine for themselves the suitability of CHEMRA materials and suggestions for any use prior to their adoption. Specifications might be subject to change without further notice. Materials safety data sheets and handling methods are available on request.

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