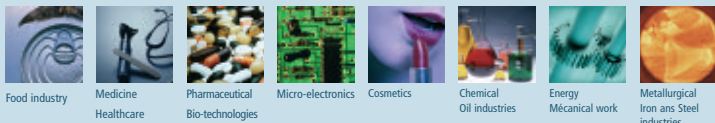


Resin demineralisation

PERMO standards



03# ION EXCHANGE RESINS (2)



Resin demineralisation.

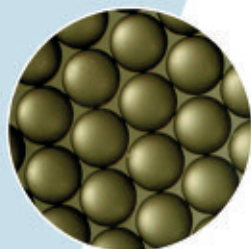
The ion exchange process is widely used to eliminate practically all ions present in the water. The technology, known as demineralisation, outputs water of very high chemical purity characterized by its very low conductivity.



The specific characteristics of cationic and anionic resins and the technology of equipment incorporating them allow treatments to match the quality of the industrial water sought.

According to the adopted system, it can provide water of very low conductivity.

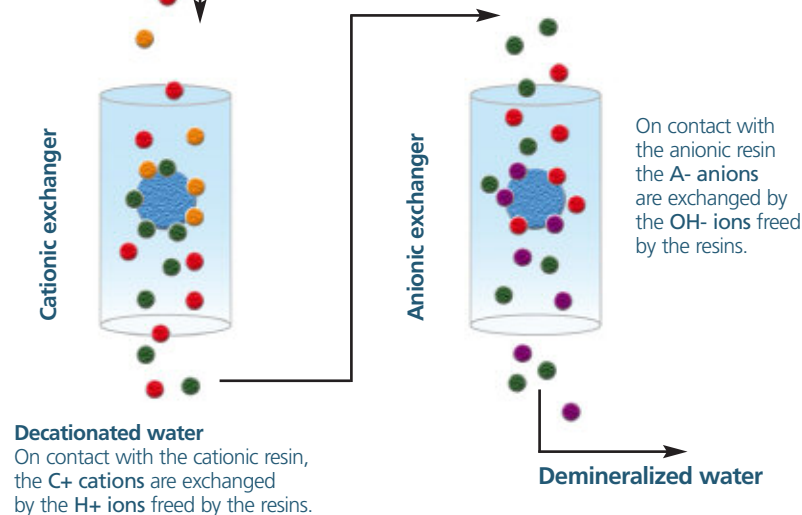
Close-up of resin.



Untreated water containing cations and anions

- A⁻ Anions
- C⁺ Cations
- H⁺ Ions
- OH⁻ Ions
- Resin ball

Diagram of ion exchange process



Ion exchange process

The ion exchangers or ion exchanging resins are made up of insoluble solids with, at the core of their structure, mobile ions attached to the basic skeleton by means of «functional groups». The ion exchanging resins are characterized by their affinity relative to cations or to anions. The association of so-called cationic or anionic resins in the same chaining system give rise to demineralized water.

In the depletion phase, the cationic resin in the H⁺ form fixes the water cations, the latter being replaced by the H⁺ ions freed by the cationic resin. The same is true for the anionic resins relative to the anions. In that case the anions fixed by the resin are replaced by the OH⁻ ions freed by the anionic resin.

At the end of the cycle, when the resins are saturated, they must be regenerated using acid for the cationic resin and soda for the anionic resin.

PERMO **AUTOMATIC MIXED BEDS**

5 TO 55 M³/HR



ELECTRONICS INDUSTRY

The Mixed bed technique integrates a single tank loaded with a mix of highly regenerated cationic resin under its H⁺ form and of highly regenerated anionic resin under its OH⁻ form. Mixed beds limit ionic losses to a low level, i.e.: offering water close to the pH value of 7, dissolved silica contents less than 10 µg/litre and conductivity between 1 and 0.055 µs inclusive.

Made of a shell in polyester or ebonited steel, the range caters for rates of from 5 to 55 m³/hr.

CHARACTERISTICS

Designation	Maximum flow in m ³ /h	Shell diameter
LM400	5	400 mm
LM500	8	500 mm
LM600	12	600 mm
LM700	18	700 mm
LM800	20	800 mm
LM900	30	900 mm
LM1000	36	1000 mm
LM1100	45	1100 mm
LM1200	55	1200 mm

PERMO **DECARBONATERS - DEMINERALISERS - CO₂ ELMININATORS**

5 TO 55 M³/HR

The so-called «partial demineralisation» decarbonation reduces the carbonated hardness of water. The excellent performance of the low cationic resins used make the process very economic for the production of steam boiler and heating water, and for certain processes.

Made of a shell in polyester or ebonited steel, the range caters for rates of from 5 to 55 m³/hr while as an option PERMO decarbonation-softening monoblock units are available based on superposed beds of low cationic resins and softening resins.

Can be installed in multiplex configuration. A range of atmospheric degassers in polyethylene ensure the elimination of CO₂ freed by the process.

The range of exchangers used for decarbonation allow the design and installation of comprehensive demineralization chaining systems with rates of from 5 to 55 m³/hr.



CHEMICAL INDUSTRY

PERMO DLM EXCHANGE MIXED BEDS

0,25 TO 20 M³/HR

A global concept leading to demineralized water of very high quality.

The incorporation of an exchange system of resin bottles enables supplies of demineralized water with rates of up to 20 m³/hr.

Fed from supplies of drinking water or pre-treated water (reverse osmosis), the exchangers (bottles) containing a mix of strong cationic and strong anionic resins collect the dissolved mineral salts. The quality of the produced demineralized water is measured by a conductivity meter. When the exchange capacity of the resins is depleted, standard exchange takes place, the saturated resins are recovered to be regenerated off site.

For all demineralized water needs.

To ensure occasional backup.

To provide a relay for the production tool during maintenance periods.

For various requirements:

- Sterilizers
- Washing machines
- Oven cooling
- Ultrasonic machines
- Air-conditioning
- Batteries
- Laboratory facilities



STATION OF REGENERATION



PRE-ASSEMBLED DEMINERALIZATION STATION

PERMO +

Backed by a capital of more than 80 years of water treatment know-how, PERMO is now the undisputed front runner for the design and manufacture of ion exchange equipment.

PERMO offers a range of standard and customized demineralizers with the capacity of meeting all user needs in any field of activity.

SERVICE +/ SOS DEMINERALIZATION

Mounted on a mobile carriage, mixed bed resin demineralization units can be very quickly installed on site. The units produce instant demineralized water using mobile systems.

To meet the growing requirements of its partner customers, PERMO holds a permanent stock of regenerated mixed bed resin bottles.

Many categories of industrial users (cosmetics, pharmaceuticals, semiconductor makers, hospitals, chemical industry, ...) can be delivered within short time frames allowing savings in time, energy, space and money.

PERMO's service + ensures customized investments, a response fully in line with your needs. We are equipped for the disinfection of regeneration bottles and for the tracking of your standard exchanges. SOS Demineralization, the service that enables you to keep your processes going in the event of failure or maintenance of your demineralized water production system.

PERMOLIFLO is a compact, demineralized water unit producing very high quality water. The ion exchangers and all the control devices are mounted

on a corrosion-protected frame making up a mobile unit ready to be connected. Furthermore, PERMOLIFLO uses the technique of floating beds also known as «Schwebebett». Floating beds are counter-current, regenerated ion exchange devices with an upflow of water-to-be-treated during the production cycle and a downflow for regeneration. The control box with programmable automaton, the alphanumeric display and the keypad enable the recording of data involving the resistivity and the operational status of the device, and the programming of operating parameters: resistivity, regeneration phase durations, volume of the cycle, alerts and faults.

PERMOLIFLO demineralizers produce water for many types of application:

- to supply low or medium pressure steam boilers (diminution of silica losses),
- for industrial processes (pharmaceuticals, car industry, cosmetics...),
- to top up or recycle surface treatment baths,...



CHARACTERISTICS

Designation	Resins		Maximum flow	connection diameter
700	Anion	225 L	6 m ³ /hr	DN40
	Cation	150 L		
1000	Anion	325 L	8 m ³ /hr	DN40
	Cation	225 L		
1600	Anion	500 L	8 m ³ /hr	DN50
	Cation	350 L		
2500	Anion	800 L	15 m ³ /hr	DN65
	Cation	550 L		
3800	Anion	1200 L	20 m ³ /hr	DN80
	Cation	800 L		
4500	Anion	1425 L	20 m ³ /hr	DN80
	Cation	900 L		

PERMO SELECTO II

2 TO 7 M³/HR

SELECTO II range demineralizers meet your needs for demineralized water for flow rates of up to 7 m³/hr. All the equipment (except exchangers) is connected hydraulically with PVC connectors and electrically to a painted steel skid.

There are three available types of operating mode:

- Regeneration in volumetric mode with recycling in the event of non-complying water quality
- Regeneration in volumetric mode with alert in the event of non-complying water quality and installation stoppage
- Regeneration in volumetric mode by manual tripping.

SELECTO II demineralizers can operate in alternating duplex mode for uninterrupted production of water.



CHARACTERISTICS

Designation	Resins		Maximum flow	connection diameter
160	Anion	50 L	2 m ³ /hr	DN25
	Cation	50 L		
240	Anion	75 L	2,5 m ³ /hr	DN25
	Cation	75 L		
560	Anion	175 L	4 m ³ /hr	DN32
	Cation	125 L		
720	Anion	225 L	4 m ³ /hr	DN32
	Cation	150 L		
1040	Anion	325 L	7 m ³ /hr	DN40
	Cation	225 L		



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