Ecomix®

ADVANCED SOFTENING MATERIAL FOR PROBLEM WATER

SIMPLE SOLUTION FOR 5 PROBLEMS

- hardness
- iron
- manganese
- natural organic matter
- ammonium

Used by water treatment companies globally since 1998

EUROPE

WHAT ECOMIX® IS

ECOMIX® is a scientifically grounded technology, confirmed by 6 patents and service world-wide since 1998.

ECOMIX® works effectively in well water and municipal water within the allowable concentrations of iron and manganese, hardness and natural organic matter.

ECOMIX® consists of five ingredients, including two patented materials.

82
materials researched

1998
developing and patenting Ecomix®

6 patents

Ecomix® purifies water from:

- hardness
- iron
- manganese
- natural organic matter
- ammonium

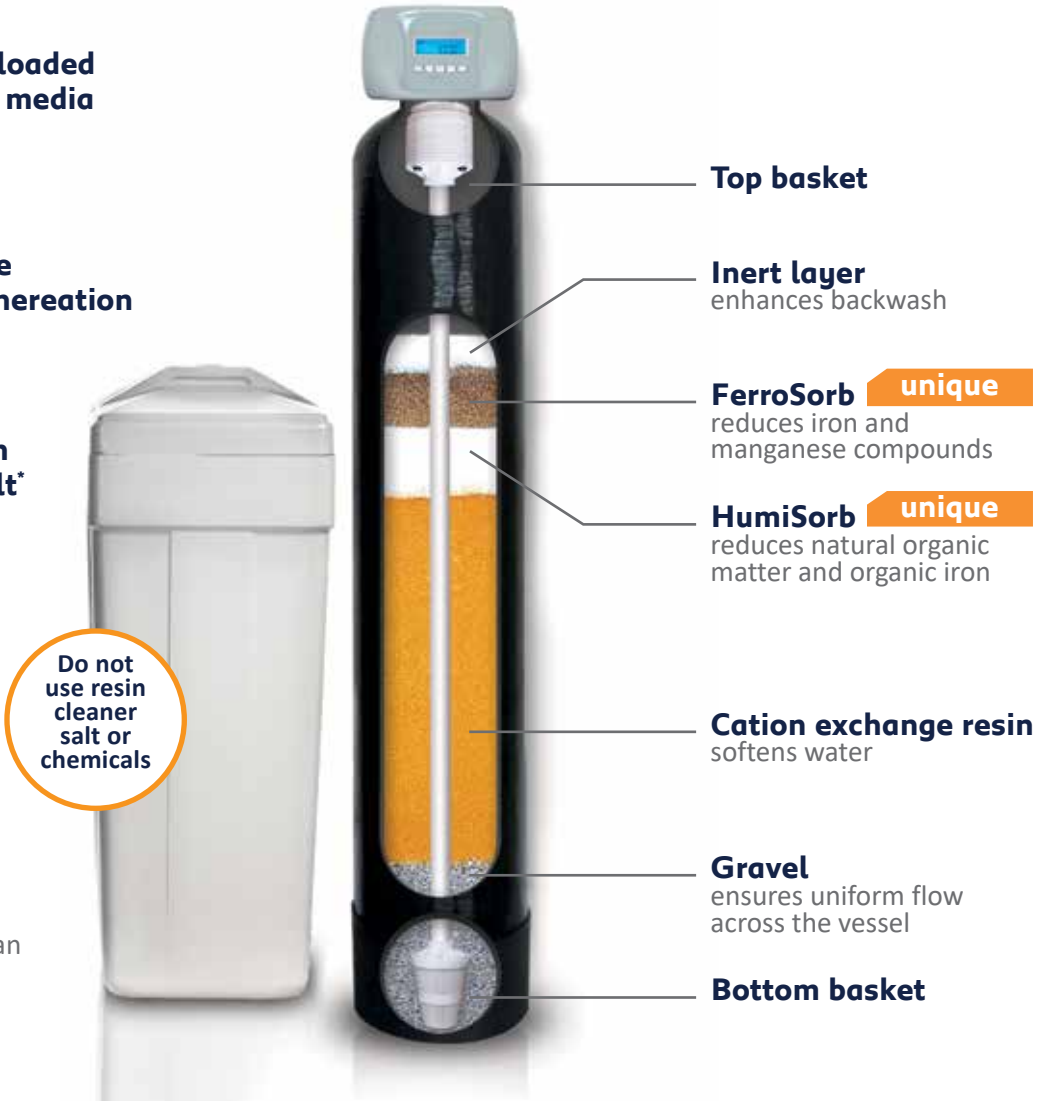
Certified in compliance with the NSF/ANSI 44/61/372 standards

HOW ECOMIX® WORKS

Delivered and loaded as homogeneous media

Stratifies into five layers after regenereation

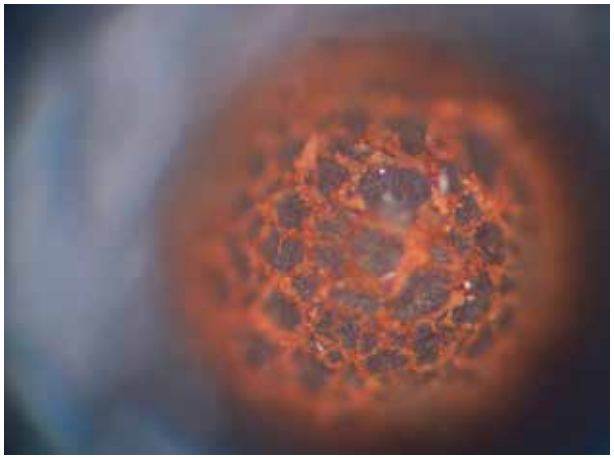
Regenerates with softener plain salt*

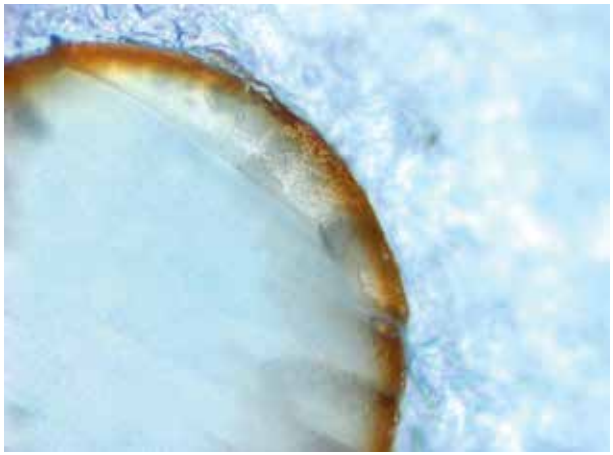


* Potassim chloride at a higher dosage can also be used

REDUCING IRON AND MANGANESE

FerroSorb is a proprietary sorption material for iron and manganese reduction





Dissected FerroSorb bead

Mechanism of iron and manganese reduction

ADSORPTION – OXIDATION – ACTIVE LAYER FORMATION – AUTOCATALYTIC OXIDATION

This chain works to reduce iron in the dissolved ferrous form (clear water iron).

The surface layer of FerroSorb contains active sites for reduction of manganese.

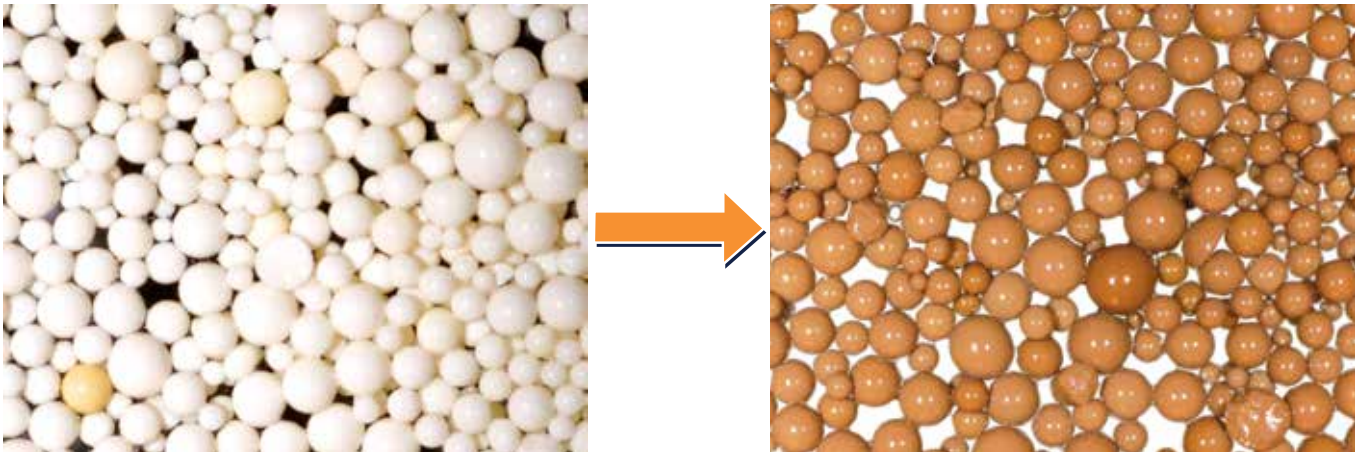
For best resuts pre-treat with a sediment filter only.

Aeration and oxidative pre-treatment should be avoided.

Treat iron bacteria before installing ECOMIX®.

REDUCING ORGANIC MATTER

HumiSorb is a proprietary sorption material for reduction of natural organic matter (reduces color and chemical oxygen demand)



Fresh HumiSorb beads **HumiSorb beads after service**

Organic compounds and organic iron are reduced due to hydrophobic and electrostatic interactions with HumiSorb.

Check the level of chemical oxygen demand before using ECOMIX® when natural organic matter reduction is desired.

ECOMIX® is intended for the treatment of well water and chlorinated municipal water from tannins.

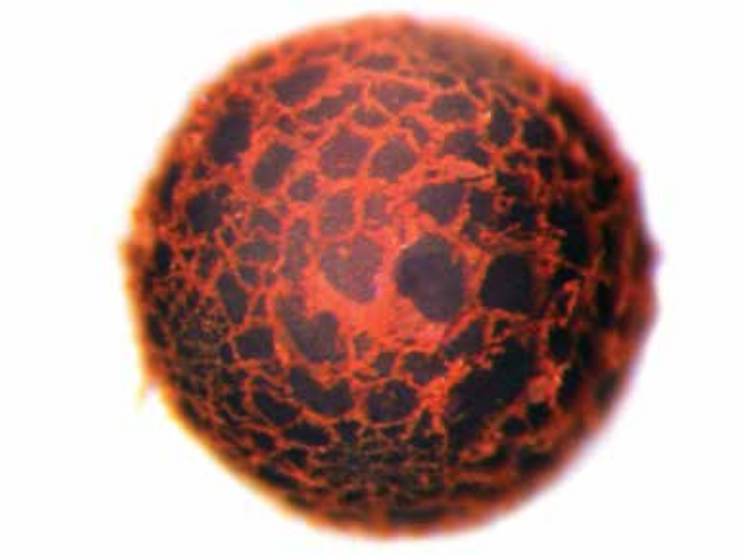
ECOMIX® is not designed for the treatment of surface water (lakes, ponds, rivers, swamps etc).

Water from a shallow well located close to the surface water should be checked for organic matter concentration and microbiological safeness.

Microbiologically unsafe water cannot be treated by ECOMIX®.

ECOMIX® REGENERATION

ECOMIX® is regenerated with the same steps as normal softeners: backwash, brine, rinse.



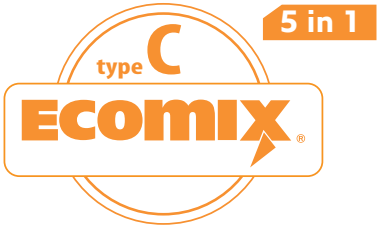
Calcium and magnesium ions are displaced from the **cation exchange resin** matrix with sodium ions.

Iron and manganese compounds are removed by surface friction of FerroSorb beads in fluidized bed during backwash.

HumiSorb exhibits a reversible mechanism of sorption of organic molecules, and is regenerated with chloride ions.

ECOMIX® EFFICIENCY AND LIMITATIONS

Raw water quality requirements and efficiency of purification



	Influent limitations	Max. efficiency, %	
		Type C	Type A
Hardness	750 ppm $CaCO_3$	97	
Iron	15 ppm	98	
Manganese	3 ppm	98	
TOC*	17 ppm C	80	50
Ammonium	4 ppm	90	

**TOC (total organic carbon) is used as a measure of natural organic matter*

OPERATING CONDITIONS:

pH 5–9

No limits on influent hydrogen sulfide or anion content

Active chlorine ≤ 1 ppm

TDS ≤ 4000 ppm

ECOMIX® TECHNICAL SPECIFICATIONS

When designing ECOMIX® units, refer to the following figures:

Parameter	Value
Service flow rate	20-25 m/h
Backwash flow rate	10-15 m/h**!!!**
Brine (slow rinse) flow rate	3-5 m/h
Minimum bed depth	500 mm
Recommended bed depth	800 mm
Freeboard	40% or more
Salt consumption	100 g/L
Brine concentration	8-10%
Water consumption per regeneration	under 10 L/L

Rust removal, resin cleaner salt, and chemicals will affect ECOMIX® performance.

If using potassium chloride increase salt dosage to 145 g/L.

ECOMIX® does not affect pH.

COMMONLY USED VESSELS

Size of vessel	1035	1054	1252	1354	1465	1665	2162
Ecomix® volume, L	25	37	50	62	75	100	150
Service flow rate, m^3/h	1.3	1.3	1.8	2.2	2.5	3.3	5.5
System capacity, kg, $CaCO_3$	0,88	1,32	1,7	2,2	2,6	3,5	5,25
Salt per regeneration, kg	2.5	3.8	5.0	6.2	7.5	10.0	15.0
Backwash flow rate, m^3/h !!!	0.6	0.6	0.9	1.1	1.2	1.6	2.7

*ECOMIX is supplied in two size types:

- Bag — 0.88 cu. ft. (25L)
- Half bag — 0.42 cu. ft. (12L)

!!! Pay attention to the backwash flow rate and choose the right drain line flow control (DLFC).

Visit **ecosoft.com/ecomix.us** to use the ECOMIX® calculator.

VOLUME CAPACITY OF ECOMIX® UNIT

Volume capacity can be calculated using just influent hardness and ECOMIX® IX capacity.

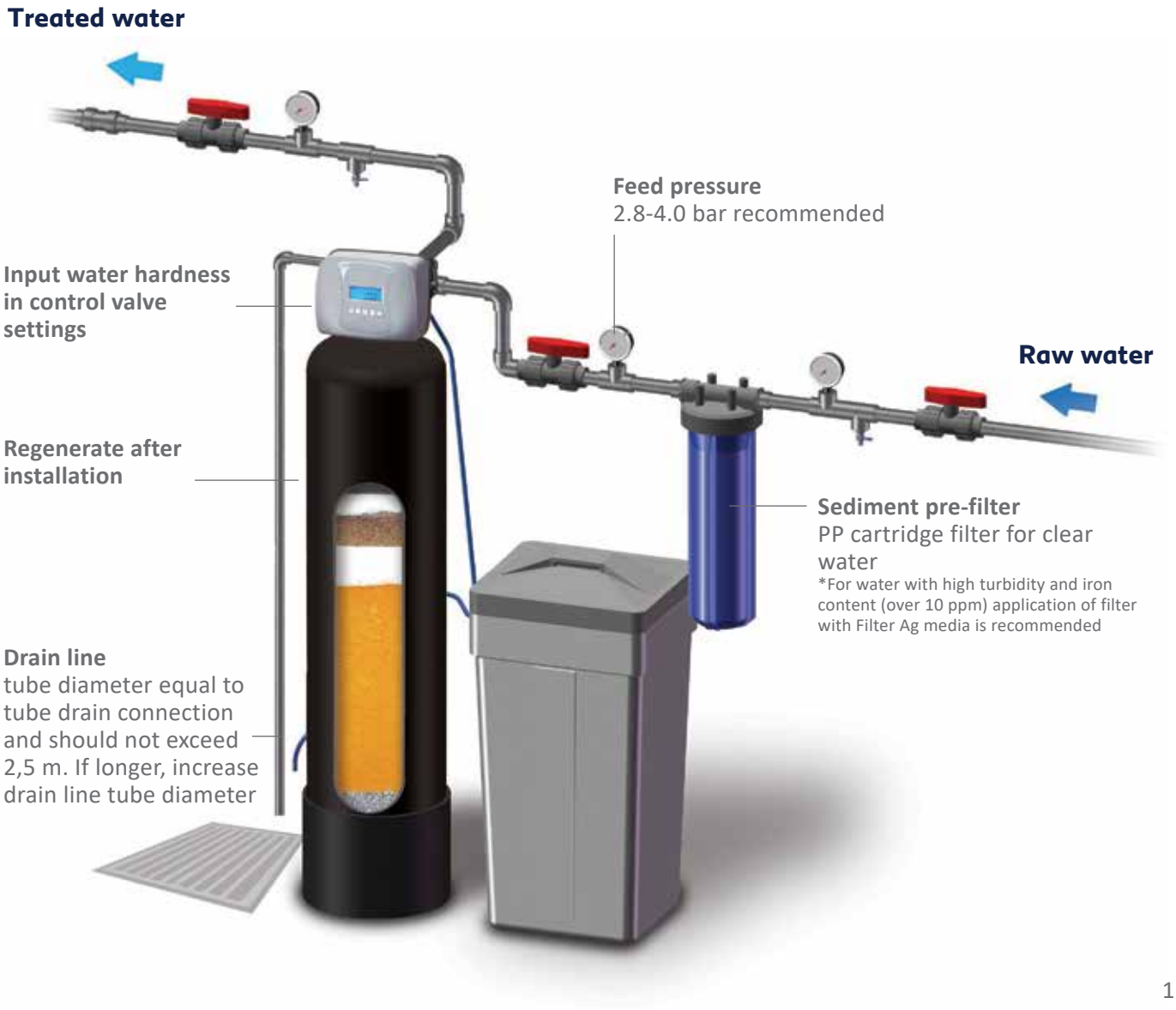
ECOMIX® C – 30 g $CaCO_3$ / L
ECOMIX® A – 35 g $CaCO_3$ / L

$$\text{Volume Capacity, } m^3 = \frac{\text{Ecomix volume, L x IX Capacity, g } CaCO_3}{\text{Influent Hardness, ppm } CaCO_3}$$

Average service life is 5 years

No need to compensate raw water hardness for iron and manganese concentration when calculating volume capacity.

ECOMIX® INSTALLATION SCHEMATIC



ECOMIX® IN RESIDENTIAL ENVIRONMENT

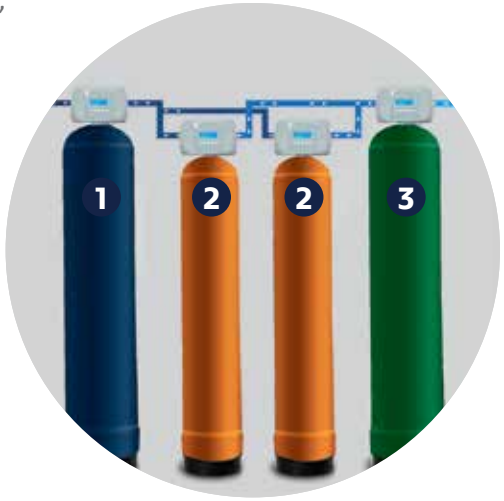
STANDARD SOLUTIONS

1 Sediment filter for sand, rust and silt removal

2 ECOMIX® system for hardness, iron, manganese, natural organic matter & ammonium removal

3 Centaur carbon system for hydrogen sulfide removal

MULTISTAGE SOLUTIONS



ECOMIX® IN COMMERCIAL AND INDUSTRIAL APPLICATIONS

ECOMIX® is used to treat raw water supplied to reverse osmosis systems, to soften and reduce iron from boiler feed water, to purify domestic water in hotels, apartment buildings and business centers.

ECOMIX® PRODUCTION

ECOMIX® is manufactured in Germany

The manufacturing process includes surface activation of FerroSorb and HumiSorb.

Digital control of ingredient mixing ensures consistent quality of finished product across batches.

ECOMIX® is certified in EU for compliance with LFGB requirements for food-contacting materials by TÜV SÜD.

ECOMIX® is certified in compliance with NSF/ANSI standards:
- NSF/ANSI 61 Drinking Water System Components – Health Effects
- NSF/ANSI 44 Residential Cation Exchange Water Softeners
- NSF/ANSI 372 Drinking Water System Components – Lead Content Scheme

ECOMIX® SUPREMACY

100 %
success rate

up to 10 years
service life

Most reliable technology for removal of iron and manganese

Highest permissible concentration of iron and manganese

Smallest regeneration salt requirement

Consistent quality of purified water throughout the material's service life

ECOMIX® is not only a unique water treatment technology. It has been a firm platform for the corporate success of numerous companies around the globe.

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SIMPLE SOLUTION
FOR 5 PROBLEMS

- hardness
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meets the requirements
LFGB
ResAP(2004)3
EU Guideline 2002/72/EG

Ecosoft Water Systems GmbH
www.ecosoft.com
www.ecomix.us