

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

AMERICA

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 (tannins).

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



82
materials researched

1998
developing and
patenting Ecomix®

6 patents

ECOMIX® reduces:

- ▶ hardness
- ▶ iron
- ▶ manganese
- ▶ natural organic matter (including tannins)
- ▶ ammonium



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

HOW ECOMIX® WORKS

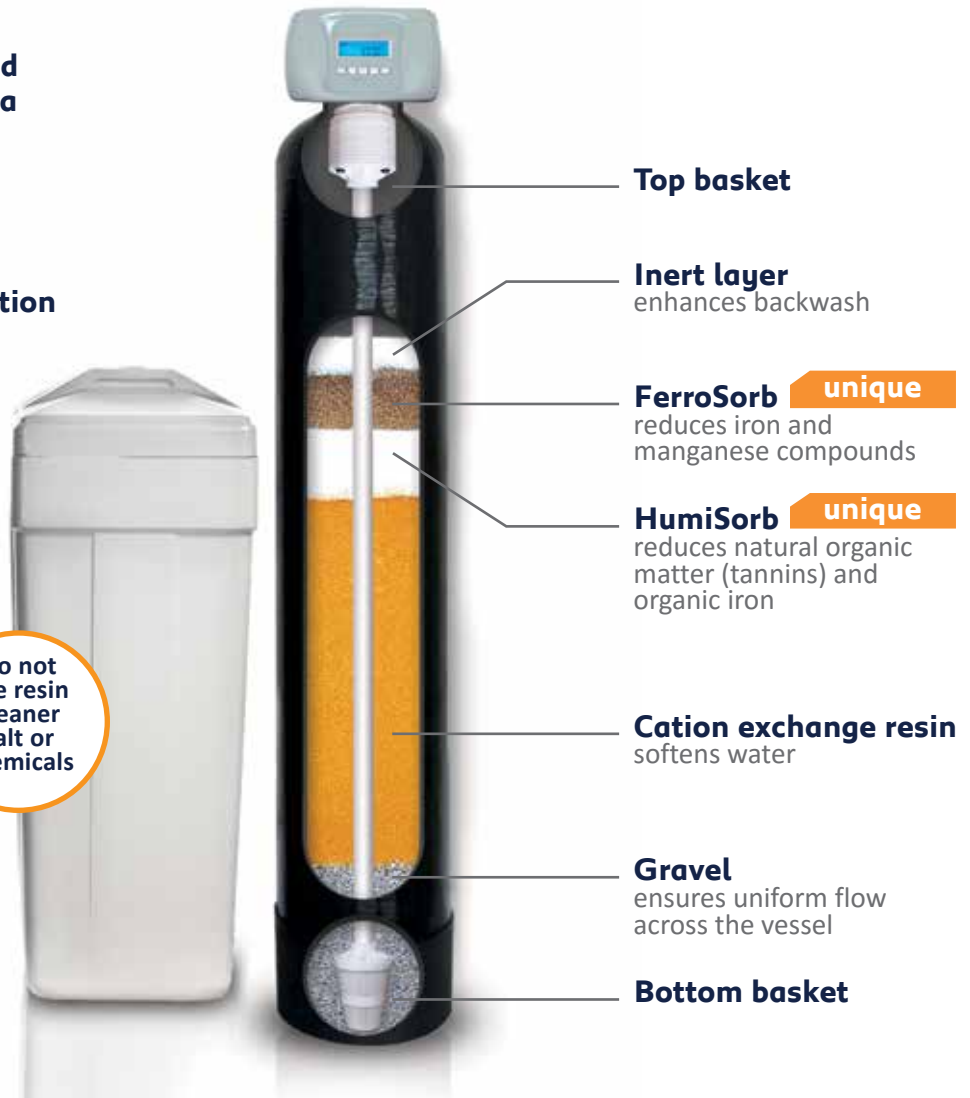
▶ **Delivered and loaded as homogeneous media**

▶ **Stratifies into five layers after regeneration**

▶ **Regenerates with softener plain salt***

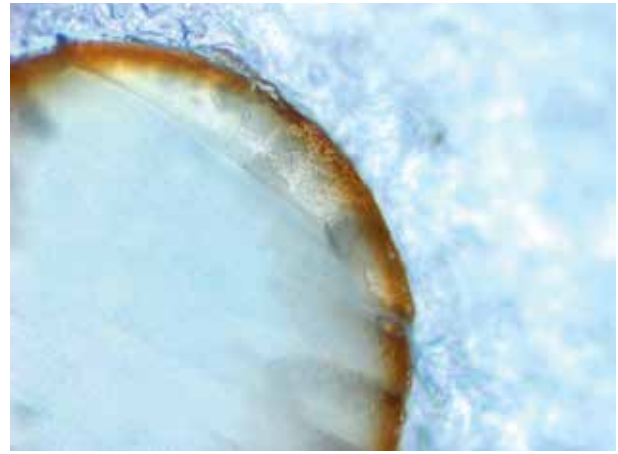
Do not use resin cleaner salt or chemicals

* Potassium 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 results 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 tannins)**



Fresh HumiSorb beads



HumiSorb beads after service

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

Check the tannins concentration before using ECOMIX® when tannins reduction is desired.

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

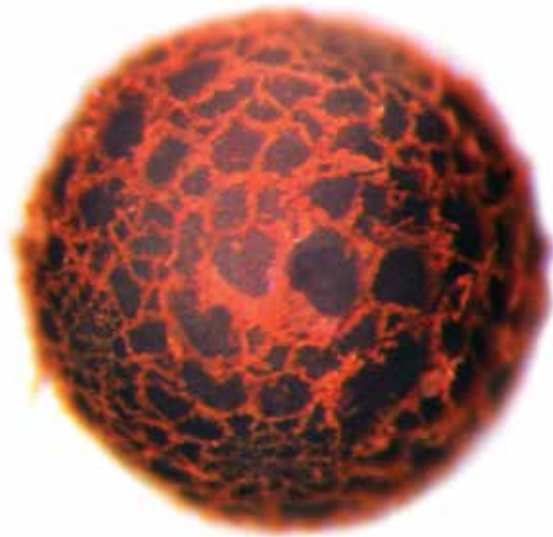
ECOMIX® is not designed for the treatment of surface water (lakes, ponds, rivers, swamps etc).

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

Microbiologically unsafe water cannot be treated by ECOMIX®.

ECOMIX® REGENERATION

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



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

Iron and manganese compounds are reduced by surface friction of **FerroSorb** beads in the 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

	Raw water limitations	Max. efficiency, %
Hardness	45 gpg	97
Iron	15 ppm	98
Manganese	3 ppm	98
TOC* (including tannins)	17 ppm C	80
Ammonium	4 ppm	90

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

OPERATING CONDITIONS:

pH 5–9

No limits on influent hydrogen sulfide or anion content

Active chlorine \leq 1 ppm

TDS \leq 4000 ppm

ECOMIX® TECHNICAL SPECIFICATIONS

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

Parameter	Value
Service flow rate	8-10 gpm/ft ²
Backwash flow rate	4-6 gpm/ft ² !!!
Brine (slow rinse) flow rate	1.2-2.0 gpm/ft ²
Minimum bed depth	20 inches
Recommended bed depth	30 inches
Freeboard	40% or more
Ion exchange capacity	13,000 grain/cu.ft.
Salt consumption	6.3 lbs/ft ³
Brine concentration	8-10%
Water consumption per regeneration	less than 75 gallon/ft ³

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

If using potassium chloride increase salt dosage to 9 lbs/ft³.

ECOMIX® does not affect pH.

COMMONLY USED VESSELS



Size of vessel	1035	1054	1252	1354	1465	1665	2162
ECOMIX® volume, bags*	1.0	1.5	2.0	2.5	3.0	4.0	6.0
Service flow rate, gpm	5.7	5.7	8.0	10.0	11.0	14.5	24.3
System capacity, grains	11,500	17,000	23,000	28,500	34,500	46,000	69,000
Salt per regeneration, lbs.	5.5	8.4	11.0	13.7	16.5	22.0	33.0
Backwash flow rate, gpm !!!	2.7	2.7	4.2	5.3	6.5	7.5	11.3

*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 ecomix.us to use the ECOMIX® calculator.

VOLUME CAPACITY OF ECOMIX® UNIT

- ▶ **Volume capacity can be calculated using just influent hardness and ECOMIX® system capacity.**

$$\text{Volume Capacity, gal} = \frac{\text{System Capacity, grains}}{\text{Raw water Hardness, gpg}}$$



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

ECOMIX® INSTALLATION SCHEMATIC

Treated water



Feed pressure
40-60 psi recommended

Input water hardness
in control valve
settings

Raw water

**Regenerate after
installation**

Sediment pre-filter
PP cartridge filter for clear water
*For water with high turbidity and iron
content (over 10 ppm) application of filter
with Filter Ag media is recommended

Drain line
tube diameter equal to
valve drain connection
and should not exceed 8 ft.
If longer, increase drain line
tube diameter

ECOMIX® IN A RESIDENTIAL ENVIRONMENT

STANDARD SOLUTIONS



1

Sediment filter for sand, rust and silt reduction

2

Ecomix system for hardness, iron, manganese, natural organic matter & ammonium reduction

3

Centaur carbon system for hydrogen sulfide reduction



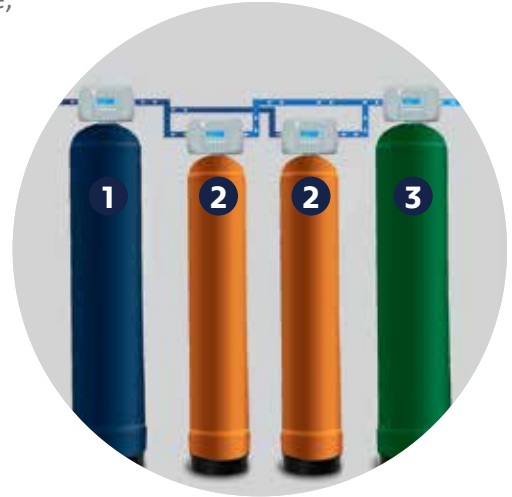
MULTISTAGE SOLUTIONS



1

2

3



1

2

2

3

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

ECOMIX®
i n s i d e 

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 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.



SIMPLE SOLUTION FOR 5 PROBLEMS

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

**ECOMIX® is certified in compliance
with NSF/ANSI standards**

ECOMIX® is certified in EU by TÜV SÜD

meets the requirements

LFGB

ResAP(2004)3

EU Guideline 2002/72/EG

Ecosoft Water Systems GmbH

www.ecosoft.com

www.ecomix.us