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

WHAT IS ECOMIX®

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

- ECOMIX® is a composite water treatment technology protected by 6 patents and with a global successful track record since 1998.
- ECOMIX® effectively purifies **well water and municipal water** from iron, manganese, hardness and natural organic matter.
- ECOMIX® consists of five ingredients, including two patented materials.
- ECOMIX® is compatible with normal softener hardware and regenerates with regular softener salt.

Milestones:

- 82 materials researched during development
- developed and patented in 1998
- 6 patents obtained
- NSF/ANSI and LFGB health certificates
- successfully marketed and used on 5 continents

Ecomix® purifies water from:

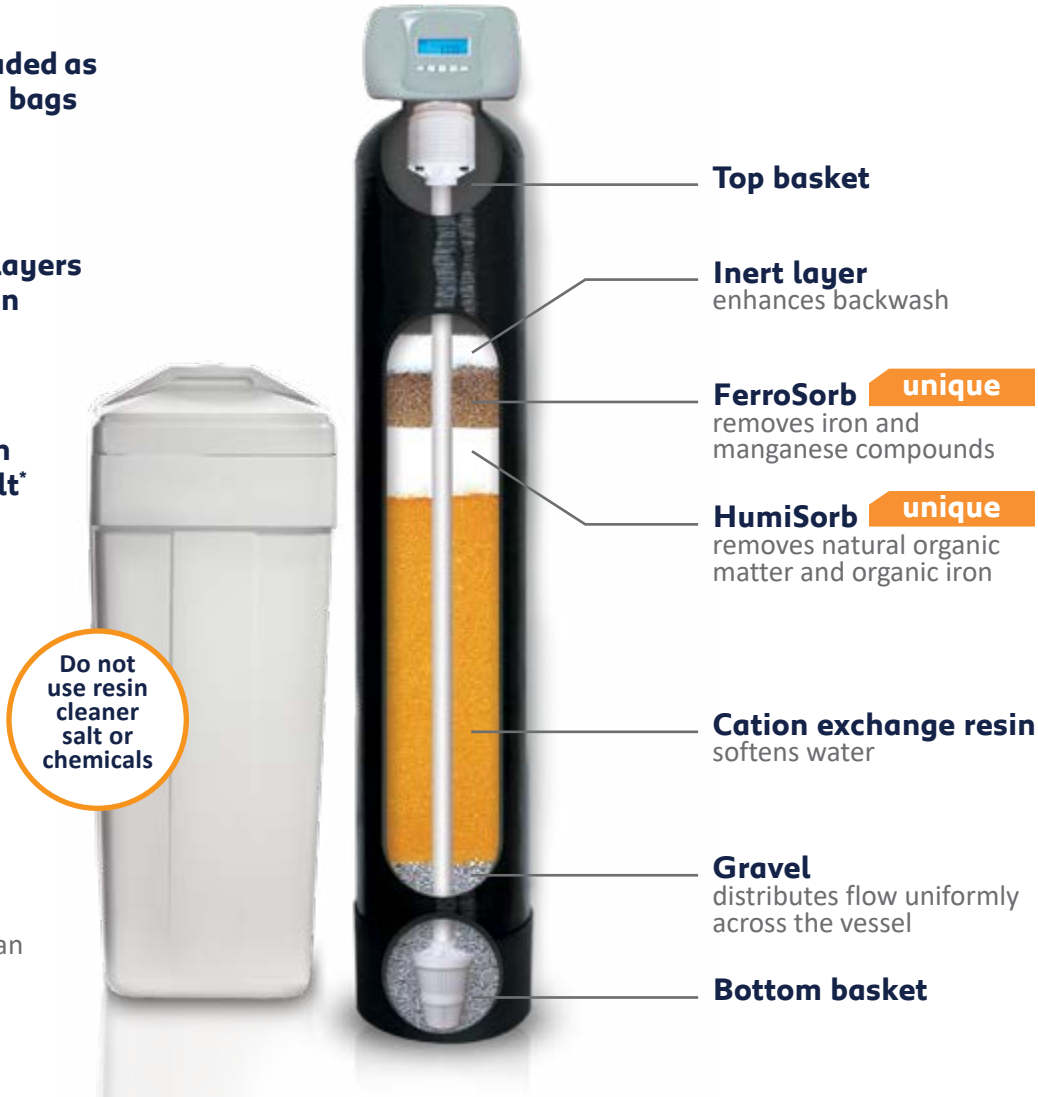
- hardness
- iron
- manganese
- natural organic matter
- ammonium

HOW ECOMIX® WORKS

Delivered and loaded as a single media in bags

Stratifies in five layers after regeneration

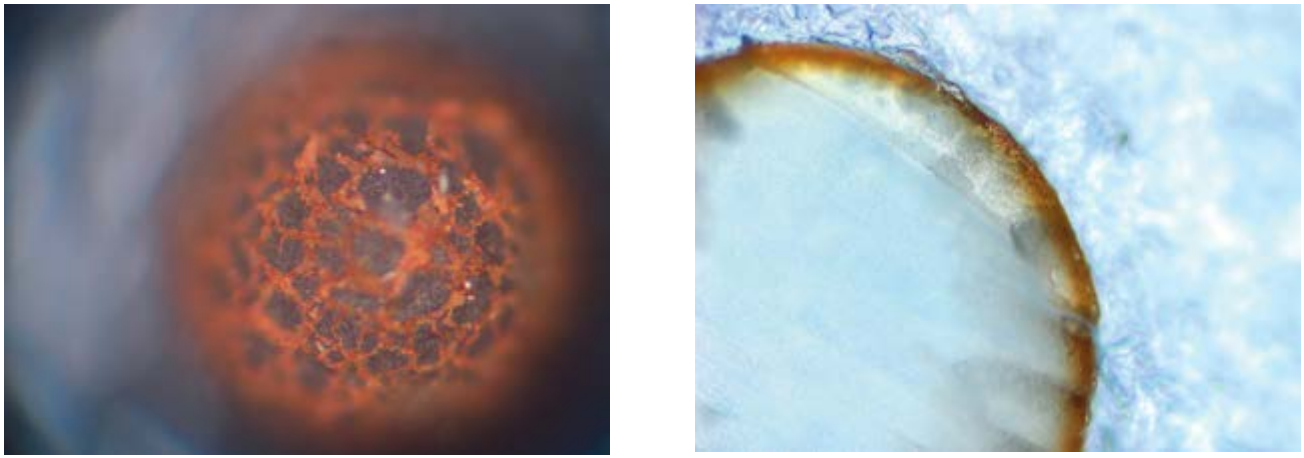
Regenerates with plain softener salt*



* Potassium chloride at a higher dosage can also be used

IRON AND MANGANESE REMOVAL

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

The process chain removes soluble ferrous iron from clear influent water.

The surface layer of FerroSorb beads also contains active sites for binding manganese.

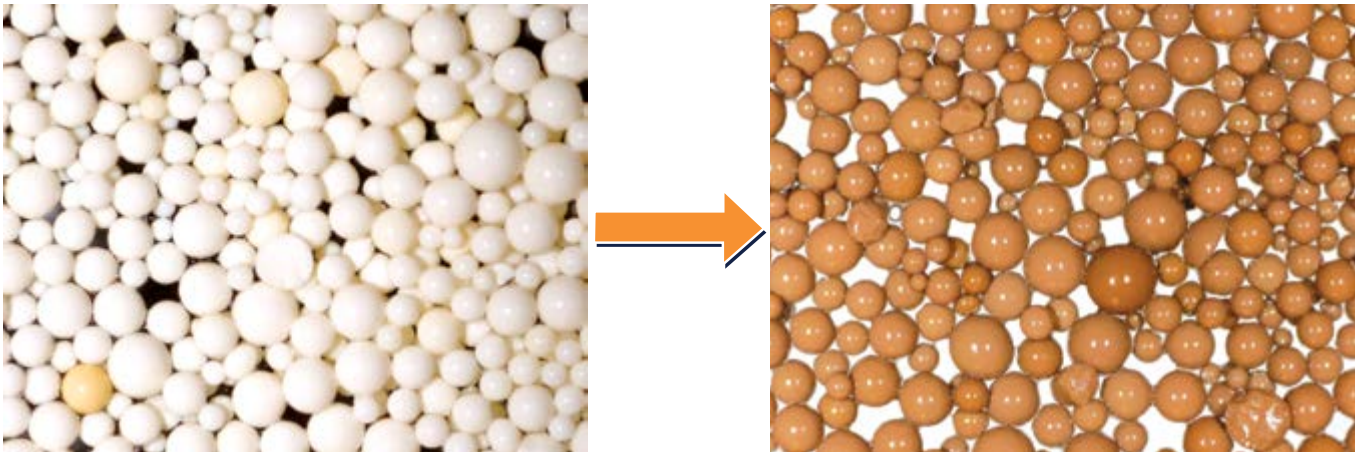
For best results pre-treat with a sediment filter only.

Aeration and oxidative pre-treatment must be avoided.

Treat water against iron bacteria before installing ECOMIX®.

NATURAL ORGANIC MATTER REMOVAL

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 retained through hydrophobic and ionic interactions with HumiSorb matrix.

Determine chemical oxygen demand before using ECOMIX® to purify high organic color water.

ECOMIX® is intended for the treatment of well water as well as municipal tap water from tannins.

ECOMIX® is not intended for surface water treatment (water from lakes, ponds, rivers, marshes etc).

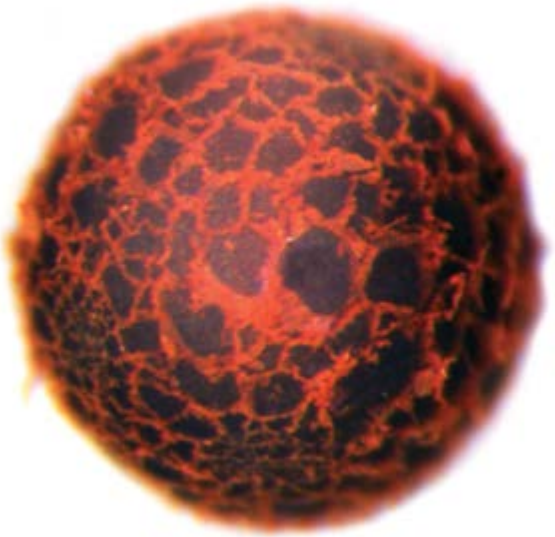
Water from shallow wells located in vicinity of surface water bodies should be tested for Chemical Oxygen Demand/Total Organic Carbon, and microbial counts.

Microbiologically unsafe water cannot be treated by ECOMIX®.

ECOMIX® REGENERATION

ECOMIX® is regenerated with the same regeneration sequence used with regular softeners:

1. backwash
2. slow brine rinse
3. fast rinse
4. brine tank refill



Calcium and magnesium ions are retained by the **cation exchange resin**, then displaced with sodium ions and flushed during brine regeneration.

Iron and manganese hydroxides are removed from **FerroSorb** by friction. The beads rub against one another when the bed becomes fluidized during backwash.

HumiSorb retains organic molecules and organic bound metals by ion exchange, then the impurities are displaced with chloride ions and flushed during brine regeneration.

EFFICIENCY AND LIMITATIONS OF ECOMIX®

ECOMIX® P	ECOMIX® A	ECOMIX® C
For well or tap water with stable composition	For well or tap water with moderate organics content	For well or tap water with high organics
Requires stable quality of water	Handles seasonal variations in water composition	Handles seasonal variations in water composition without significant impact on treated water quality!

Water Quality Parameter Limitations			
Hardness, mg/l $CaCO_3$	**750**	**750**	**750**
Iron, mg/l	**15**	**15**	**15**
Manganese, mg/l	**3**	**3**	**3**
Chemical Oxygen Demand, mg/l O_2	**3**	**8** (reduced ~50%)	**20** (reduced ~80%)
Ammonium, mg/l	Is not removed	**4**	**4**
Service life, years	**3**	**5**	**5**

OPERATING CONDITIONS:

- **pH 5–9**
- **No limits on influent hydrogen sulfide or anion content**
- **Active chlorine ≤ 1 mg/l**
- **TDS ≤ 4000 mg/l**

ECOMIX® TECHNICAL SPECIFICATIONS

Key design parameters for ECOMIX® systems

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 dosage per bed volume	100 g/L
Brine concentration	8-10%
Water usage per regeneration	max. 10 bed volumes

Rust removal additives, resin cleaner salt, and other aggressive chemicals will affect performance of ECOMIX® and should not be used.

If using potassium chloride, increase salt dosage to 150 g/L.

ECOMIX® will not affect water 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	1.0	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 bag sizes:

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

Please pay attention to the **backwash flow rate** and choose the right **drain line flow control** (DLFC).

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

VOLUME CAPACITY OF ECOMIX® SOFTENER

Volume capacity is calculated with only influent hardness and ECOMIX® IX capacity.

Ion Exchange Capacity by Type

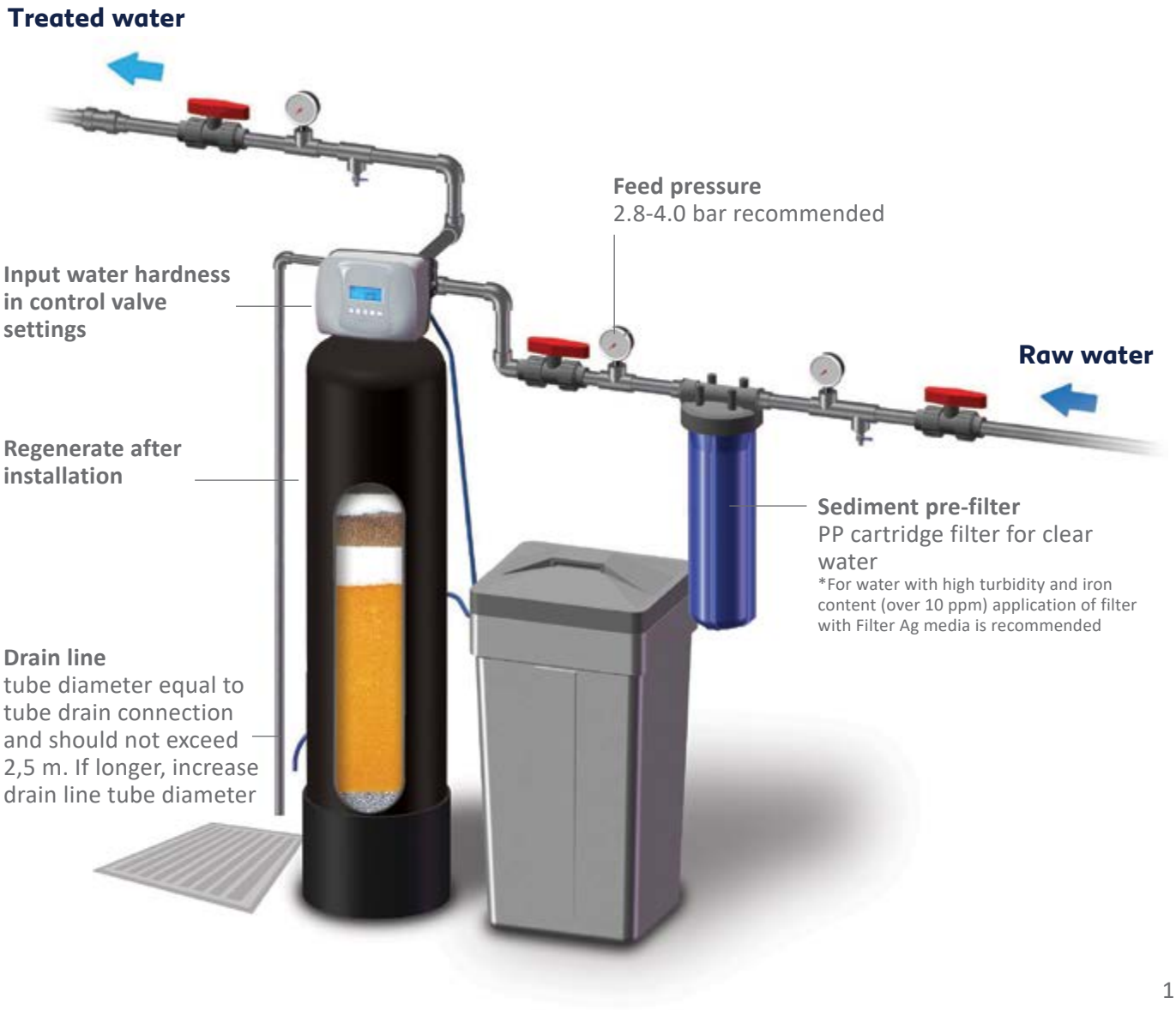
ECOMIX® P – 40 g $CaCO_3$ / L
ECOMIX® A – 35 g $CaCO_3$ / L
ECOMIX® C – 30 g $CaCO_3$ / L

$$\text{Volume Capacity, } m^3 = \frac{\text{Quantity of Ecomix, L} \times \text{Ion Exchange Capacity, g } CaCO_3}{\text{Influent Hardness, mg/l } CaCO_3}$$

Iron and manganese determinands are not necessary for calculating volume capacity of Ecomix unit

Average service life is 5 years

ECOMIX® SETUP



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 activated carbon system for removal of hydrogen sulfide

MULTISTAGE SOLUTIONS

ECOMIX® IN COMMERCIAL AND INDUSTRIAL APPLICATIONS

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

ECOMIX® MANUFACTURING FACILITIES

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® IN NUMBERS

treats **5** most common water quality issues

ECOMIX® inside

up to **10** years service life

- simple volume capacity formula requiring only raw water hardness
- high effectiveness regardless of water pH (5…9), H_2S presence, and anionic composition
- no acid, caustic, or deironing chemical products required for regeneration, just regular softener salt
- no oxidant pre-treatment required for iron and manganese removal
- no iron or manganese dumping if volume capacity is exceeded
- usable with ordinary water softeners
- low salt demand — typically 100…120 g NaCl per liter (6…8 lbs/ft^3) per regeneration
- low water demand — typically 5-10 bed volumes per regeneration
- NSF/ANSI and TÜV SÜD health certificates

ECOMIX® is not only a unique water treatment technology, ECOMIX® has been a firm foundation for sustainable development of numerous companies around the world.

ECOMIX®

SIMPLE SOLUTION
FOR 5 PROBLEMS

- hardness
- iron
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- natural organic matter
- ammonium

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

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