



# 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

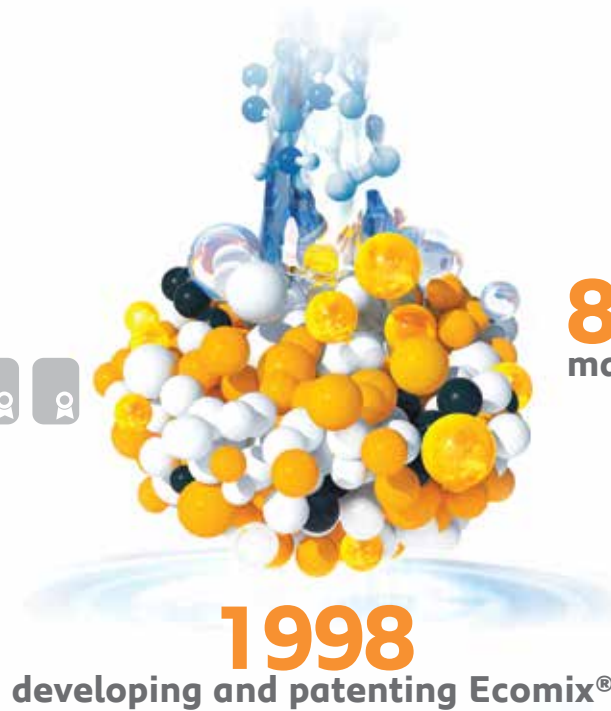
## WHAT ECOMIX® IS

- ▶ **Filtration material for problem water with iron compounds.**  
**Contains five ingredients of various origin, including two patented materials**

**6** patents



**82**  
materials researched



**1998**

developing and patenting Ecomix®

Ecomix® purifies water from:

- ▶ 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**

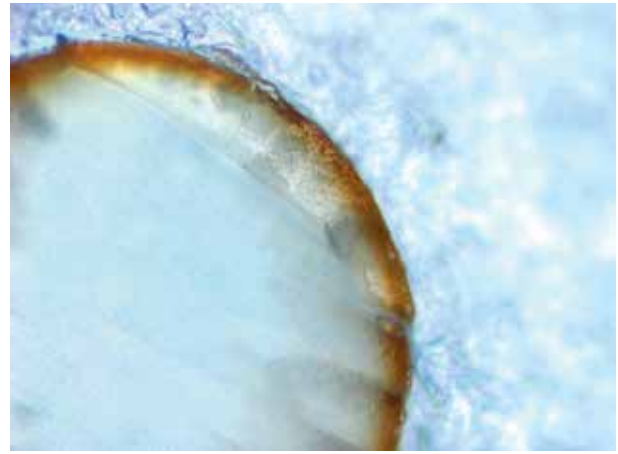
▶ **Classifies in five strata on first regeneration**

▶ **Regenerates with common softener salt**



# REMOVING IRON AND MANGANESE

▶ **FerroSorb is a proprietary sorption material for iron and manganese removal**



*Dissected FerroSorb bead*

## **Mechanism of iron removal**

ADSORPTION – OXIDATION – ACTIVE LAYER FORMATION – AUTOCATALYTIC OXIDATION

This chain works to remove iron in dissolved, oxide, organic, and colloid forms.

Surface layer of FerroSorb contains active sites for sorption of manganese.

Ecomix works best with raw wellwater supplied directly to Ecomix unit.

Oxidative pre-treatment is unnecessary and should be avoided.

## REMOVING ORGANIC MATTER

- ▶ **HumiSorb is a proprietary sorption material for removal of organic impurities (reducing color, tannins, chemical oxygen demand)**

Organic compounds are removed by the mechanism of hydrophobic and electrostatic interactions.



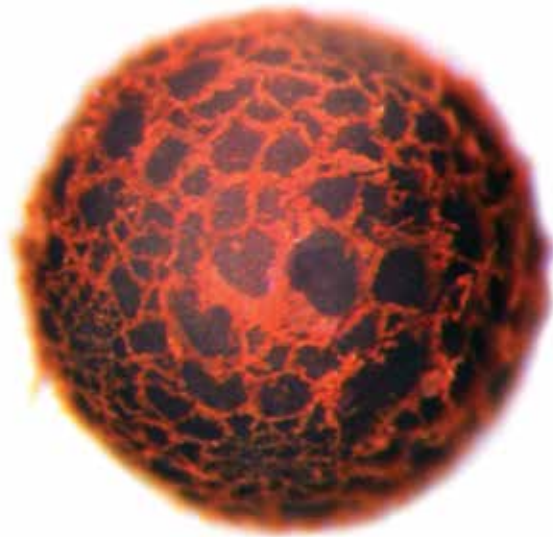
**Fresh HumiSorb beads**



**HumiSorb beads after service**

## ECOMIX® REGENERATION

Ecomix® regenerates 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
<b>Hardness</b>	750 ppm CaCO <sub>3</sub>	97	
<b>Iron</b>	15 ppm	98	
<b>Manganese</b>	3 ppm	98	
<b>TOC*</b>	17 ppm C	80	50
<b>Ammonium</b>	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



## COMMONLY USED VESSELS

Size of vessel	1035	1054	1252	1354	1465	1665	2162
<b>Ecomix® volume, L</b>	25	37	50	62	75	100	150
<b>Service flow rate, m<sup>3</sup>/h</b>	1,3	1,3	1,8	2,2	2,5	3,3	5,5
<b>System capacity, kg, CaCO<sub>3</sub></b>	15	23	30	37	45	60	90
<b>Salt per regeneration, kg</b>	2,5	3,8	5,0	6,2	7,5	10,0	15,0
<b>Backwash flow rate, m<sup>3</sup>/h</b>	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)

## VOLUME CAPACITY OF ECOMIX® UNIT

▶ Volume capacity can be calculated using just influent hardness and Ecomix IX capacity.

**ECOMIX C – 30 g CaCO<sub>3</sub> / L**

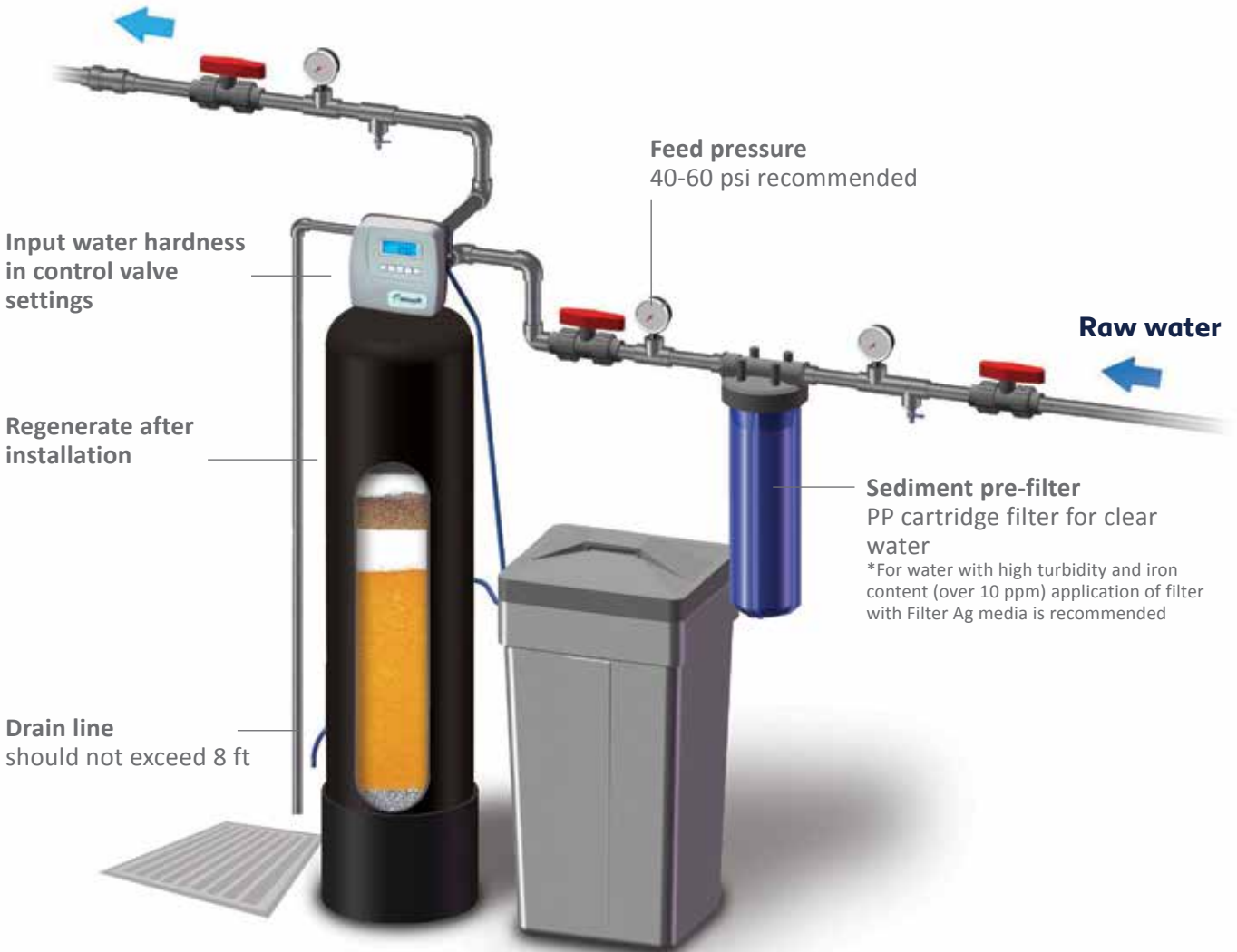
**ECOMIX A – 35 g CaCO<sub>3</sub> / L**

$$\text{Volume Capacity, m}^3 = \frac{\text{Ecomix volume, L} \times \text{IX Capacity, g CaCO}_3}{\text{Influent Hardness, ppm CaCO}_3}$$



# ECOMIX® INSTALLATION SCHEMATIC

**Treated water**



# 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



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 deiron boiler feed water, to purify domestic water in hotels, apartment buildings and business centers.

## ECOMIX® PRODUCTION



### ▶ Ecomix® is manufactured in Germany

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 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.**

# ECOMIX®



2015

Ecomix® is certified in compliance with NSF/ANSI standards

2014

2013

2012

2011

Ecomix® is certified in EU by TÜV SÜD

2010

2009

2008

2007

**18 years of success**

2006

2005

2004



2003



2002



2001



2000

1999

1998

## SIMPLE SOLUTION FOR 5 PROBLEMS

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

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