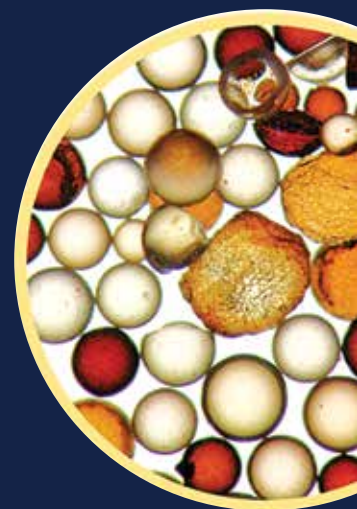


ECOMIX®

ADVANCED SOFTENING MATERIAL **for problem water**



SIMPLE SOLUTION
FOR 5 PROBLEMS

- hardness
- iron
- manganese
- organic matter & colour
- ammonia

Used by water treatment companies globally since 1998

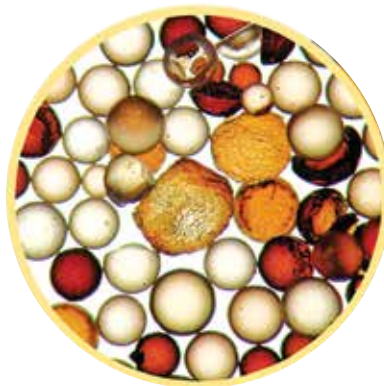
WHAT ECOMIX® IS

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

2013

**500 000 L = 20 000
units sold**

6 patents



82

materials researched

1998

developing and patenting Ecomix®

Ecomix® purifies water from:

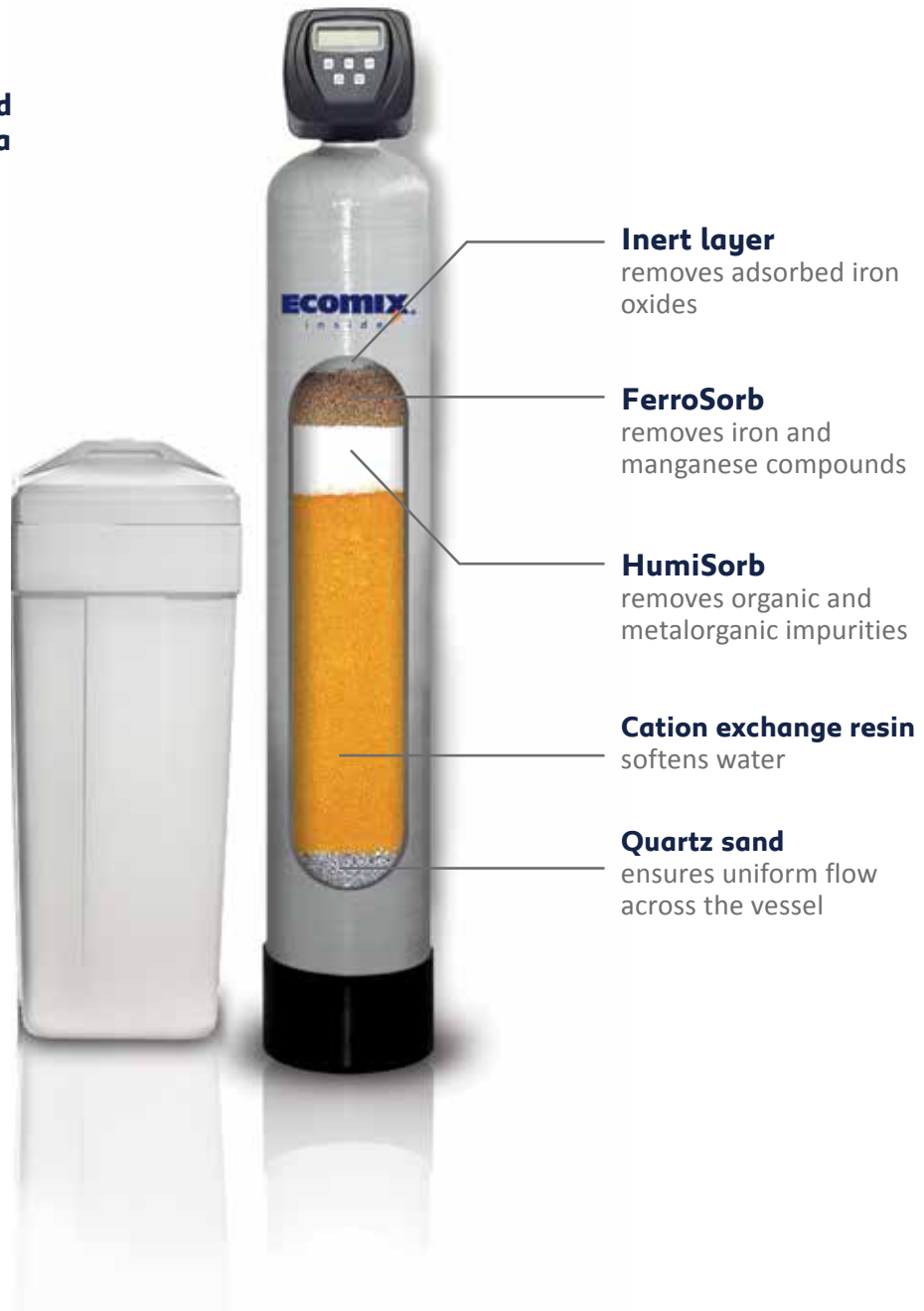
- ▶ hardness salts
- ▶ iron and manganese compounds
- ▶ organic color
- ▶ ammonia

HOW ECOMIX® WORKS

▶ **Delivered and loaded as homogeneous media**

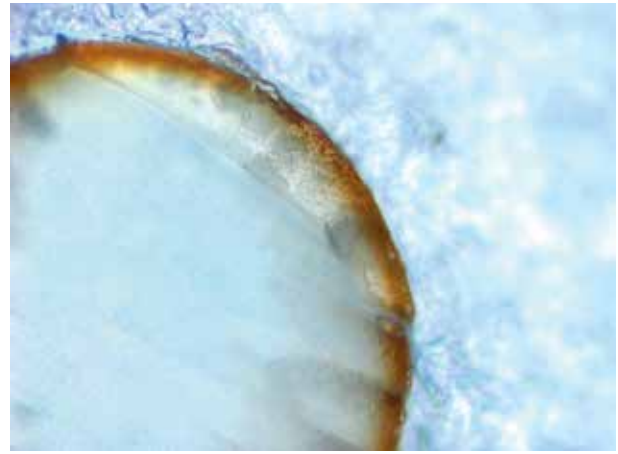
▶ **Classifies in five strata on first regeneration**

▶ **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.

VOLUME CAPACITY OF ECOMIX® UNIT

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

ECOMIX C — 30 g CaCO₃ / L

ECOMIX A — 35 g CaCO₃ / 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

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	
COD	20 ppm O ₂	80	50
Ammonia	4 ppm	90	

Operating conditions:
pH 5 to 9
No limits on influent hydrogen sulfide or anion content
Active chlorine not to exceed 1 ppm
TDS not to exceed 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

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"
Recommended bed depth	30"
Freeboard	40% or more
Salt consumption	6.3 lbs/ft ³
Brine concentration	8-10%
Water consumption per regeneration	under 75 gallon/ft ³

Ecomix® is supplied in 25 and 12 L bags (0.88 and 0.42 cubic feet).

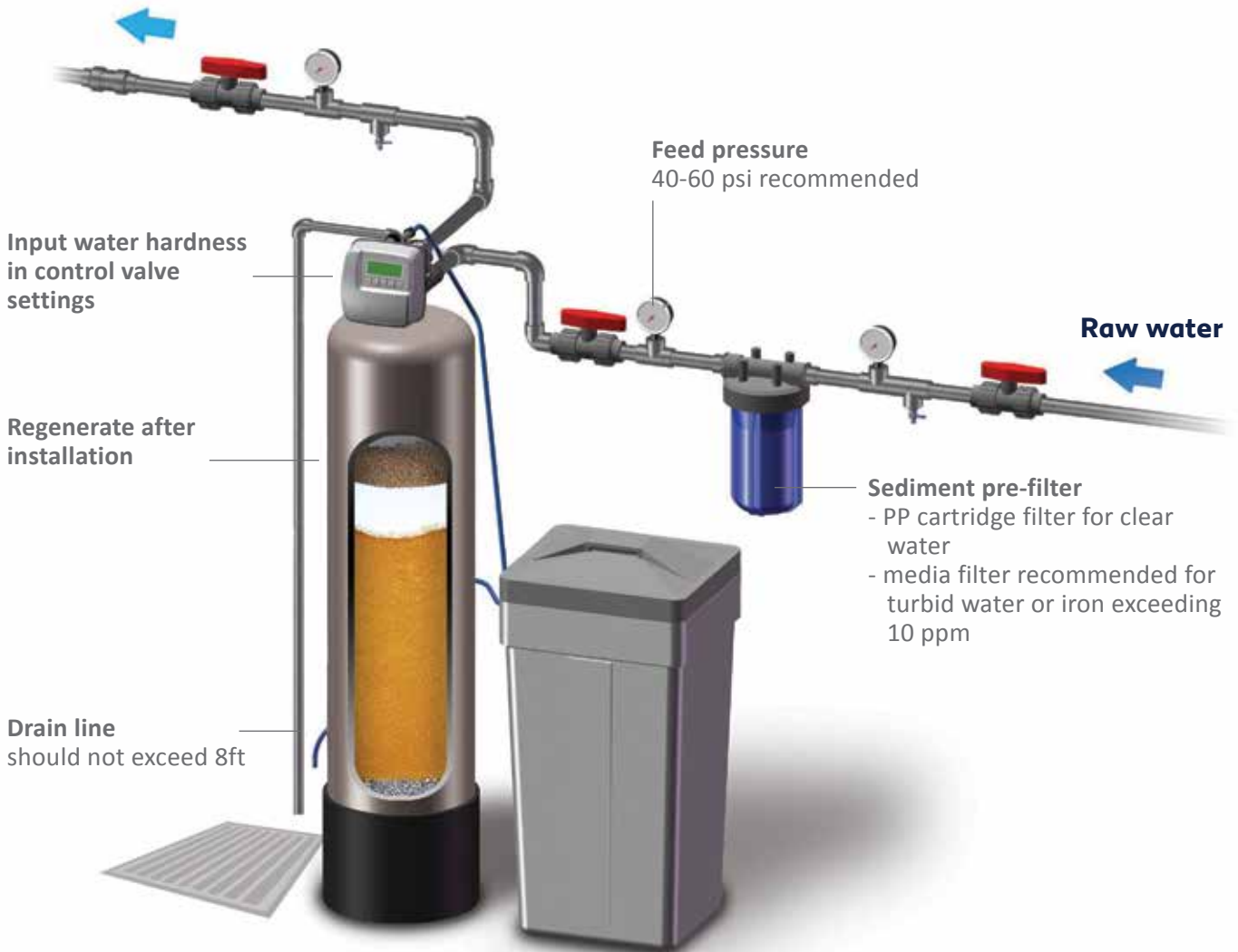
COMMONLY USED VESSELS

Size of vessel	0835	0844	1035	1054	1252	1354	1465	1665	2162
Volume of Ecomix®	18	25	25	38	50	62	75	100	150
Flow capacity, m³/h	1,0	1,0	1,3	1,3	1,8	2,2	2,5	3,3	5,5
IX capacity*, kg CaCO ₃	11	15	15	23	30	37	45	60	90
Salt requirement, kg	1,8	2,5	2,5	3,8	5,0	6,2	7,5	10,0	15,0
Backwash flow rate, m³/h	0,5	0,6	0,6	0,6	0,9	1,1	1,2	1,6	2,7

*For Ecomix® C

ECOMIX® INSTALLATION SCHEMATIC

Treated water



ECOMIX® IN RESIDENTIAL ENVIRONMENT

▶ LIGHTWEIGHT SOLUTION



▶ COMPREHENSIVE SOLUTION



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® 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.



ADVANCED SOFTENING MATERIAL
FOR PROBLEM WATER

2014

2013

2012

2011

2010

2009

2008

2007

2006

2005

2004

2003

2002

2001

2000

1999

15 years Certified in EU

Ecomix® is certified in EU by TÜV SÜD

500 000 L a year



SIMPLE SOLUTION FOR 5 PROBLEMS

- hardness
- iron
- manganese
- organic matter & colour
- ammonia

