Aqua-Paradies® GmbH
Beregnungs- und Pumpenanlagen vom Profi

DE Ferro® – Natural Water Treatment

Frees your groundwater of iron, manganese and ammonium

With a success guarantee!

The DE Ferro®-family

For home and garden!

Do you know the dilemma? You have your own house well and could therefore be independent of the public fresh water supply and the associated costs, but the precious well water is unusable as drinking water due to excessive iron, manganese and ammonium values. With our DE Ferro® water treatment system, you can solve this problem in a convenient and inexpensive way!
But how does this problem come about in the first place?

Where does our groundwater come from and how do I learn more about the iron and manganese content?

Our groundwater originates from the infiltration of rainwater into the ground. Rain is oxygen-rich due to the enrichment with air. If this water makes its way into the upper soil zones, the soil bacteria consume the oxygen and in return exhale carbon dioxide. If this carbon dioxide comes into contact with the groundwater, it results in carbonic acid, which gives our groundwater a slightly acidic character.
The elements of iron and manganese are natural components of our soil and they are detached from the soil by rainwater and washed into the groundwater. They exist there in a soluble and therefore colourless form due to the lack of oxygen and the low pH value.

Are iron and manganese in my groundwater?

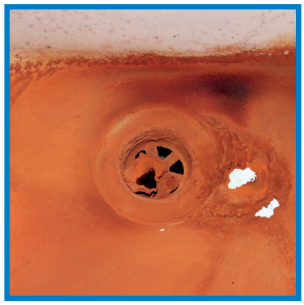
The substances in groundwater are highly dependent on the soil composition.
There are several methods for determining the content of iron and manganese in groundwater. The easiest, but at the same time most expensive alternative for you is to commission a drinking water analysis. Or try using a simple bucket test. To do this, fill a bucket with well water from a metre away using your garden hose nozzle. The water in the bucket must then rest for one day. If it has turned brownish-yellowish in the meantime and small black particles have formed, you can assume that there is iron and manganese in the well water.

What problems does this cause?

What happens if the groundwater comes into contact with oxygen again at the earth‘s surface?

The iron and manganese contained in the groundwater combine with the oxygen in the air. In the process, the two substances oxidise into their water-insoluble form. Iron first forms a brownish-yellowish turbidity and after a short time brownish flakes (rust) develop. Manganese precipitates into small black nodules, which have a diameter of a few millimetres. Manganese nodules are often confused with sand particles, but unlike sand, they develop only after some time and can crumble between your fingers..

What are indications of the oxidation of iron and manganese?



Typical characteristics of oxidised iron and manganese in water are a brown or black colour of the water, an unpleasant metallic taste and residues in sanitary facilities. In addition to this staining, a high iron and manganese content also leads to gradual clogging of pipes, valves and nozzles and therefore to increased maintenance and repair costs.
Even with your deep wells, a high iron and manganese content in groundwater can cause considerable difficulties. Due to seasonally increased water demand, the water ingress velocity in the well increases. Due to the highly developed groundwater depression cone around the well, the filter slots can draw in ground air. Oxygen oxidises with iron and manganese, whereby the elements in a water-soluble and colourless form change over into a solid state. As a result, the filter slots in your well clog. In such cases, it is called “iron hydroxide deposition in wells”. Once iron and manganese have accumulated in the well, the additional settlement of iron bacteria can make the iron hydroxide deposition even worse. Larger well systems can be regenerated mechanically or by the use of chemicals, but this is always associated with considerable costs.

How can you solve the problems?

The water needs to be treated. In conventional treatment plants, the water is enriched with oxygen and then passed through backflushable filters. It is a method that is unfortunately associated with costs for cleaning and replacing the filters and that involves a large amount of heavily contaminated backwash water being produced.

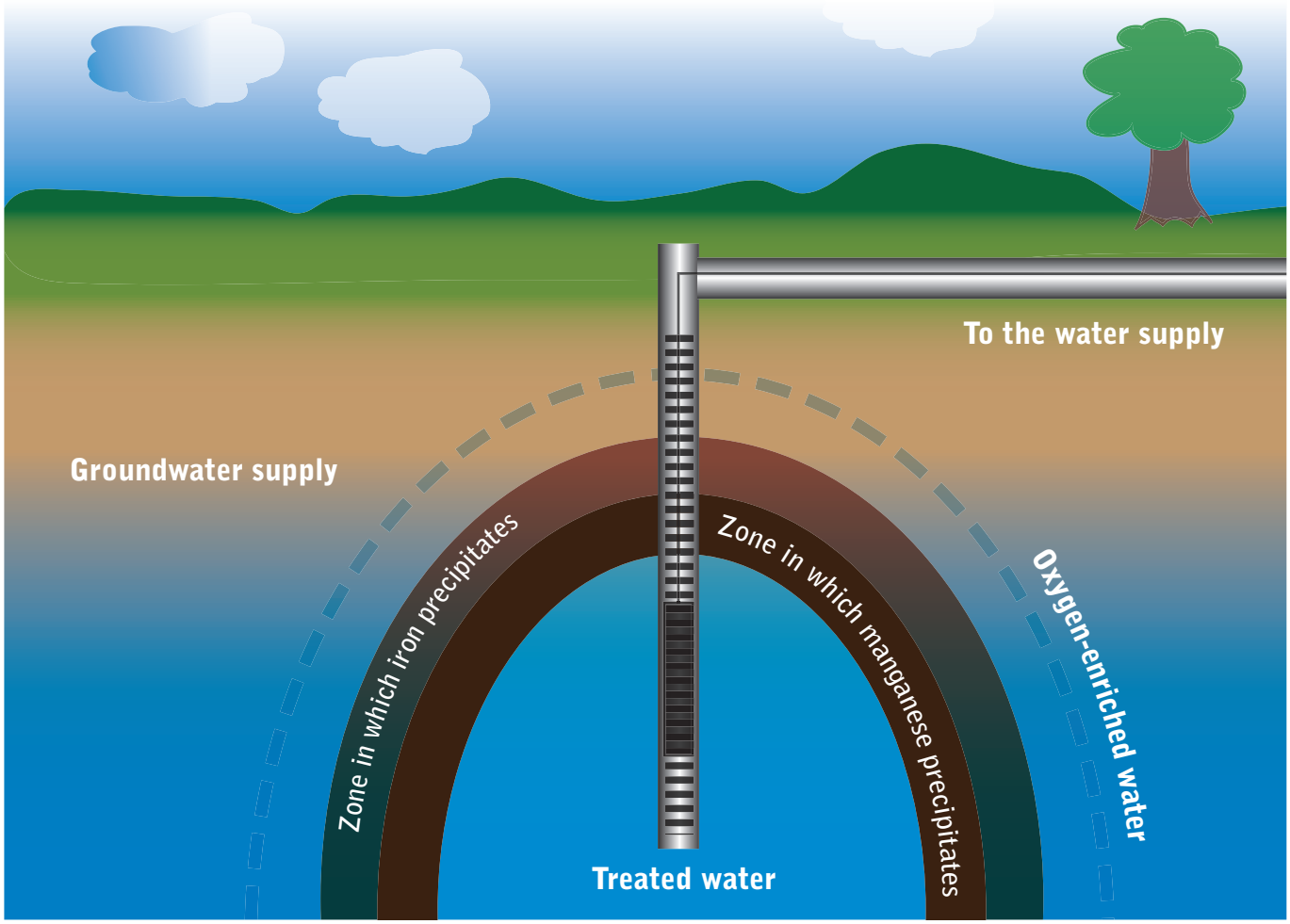
The DE Ferro® dSi treatment system offers a better solution

With the DE Ferro® water treatment, the actual treatment process is transferred to the water-bearing underground soil layers. The iron and manganese ions are bound there where they originate – in the earth! The soil thus acts as a large natural filter.

High level of efficiency!

And how does the treatment work exactly?

The DE Ferro® water treatment system enriches a partial amount of water with oxygen from the ambient air and transfers it back to the aquifer through the drilled wells. Iron, manganese and ammonium oxidise into water-insoluble substances and settle on the floor. For you, this means that after an appropriate treatment time (2-3 weeks), you will fall below the limit values of the current Drinking Water Ordinance (as of 2009) for iron and manganese (iron 0.2 mg/l, manganese 0.05 mg/l). We guarantee it!



What are your benefits?

- **Very high level of efficiency**
  Due to the treatment of the water in the soil (large natural filter) and the low flow velocity that prevails in the soil (long action time for the treatment process), our system operates with a very high level of efficiency.
- **Maintenance-free operation with no follow-up costs**
  Unlike other water treatment methods, with our DE Ferro® water treatment system you do not need to replace any filters and you do not need any chemicals for its operation.
- **Long service life of your well**
  The separation of iron and manganese occurs at a large distance from the bored well (filter area). Since treated water is conveyed, the pump, well filters, piping and fittings remain free of deposits.
- **Automatic control**
  You can run the system with two different start times.
  The additional water treatment process then takes place in a controlled manner.
  The oxygen-enriched water is pumped back into the well up to three times a day via a return line. The current process and the successful completion of the regeneration are shown in the control display.
- **Clean water**
  In order to counteract nucleation, regeneration automatically takes place after 96 hours.
- **Demand-based system sizes available**
  Depending on whether you only want to supply your household (self-provider) or you also want to simultaneously supply your garden with water, different types of systems are available to you.
  The desired amount of regeneration can be accurately set by using a contact water meter.

Natural treatment!

DE Ferro®

Professional water treatment

Automatic control!

Technical details

Our DE-Ferro® system is available in several versions!

For above ground use, two different system sizes are available to you: The version with a 500-litre capacity is optionally available with a round or square container. The 1000-litre version is available with a square tank.

Underground tank

Do you not have enough space to accommodate the system above ground? Then rely on our underground 1000-litre tank. With this version, the container is buried in the ground and only the controls have to be installed above ground.

Are 1000 litres not enough for you? No problem, because our above ground containers can easily be expanded and interconnected.

We are happy to help you determine the appropriate system size depending on your consumption and on the iron and manganese content of your water.

System control for the underground tank

Contact water meter

Convenient container size with 400 mm cleaning cover

Microprocessor control

PE plastic container suitable for drinking water.

Available now in the following sizes from stock in Berlin:

500 l (round and square)
1000 l (square above or below ground)

Other container shapes available upon request.

Emergency overflow optional

Opening for complete emptying

Bezeichnung	Length in mm	Width in mm	Height in mm	Power consumption in kW per treatment	Minimum amount of regenerated water in cubic metres per day at 2 mg iron and 0.5 mg of manganese (*)	item number
DE Ferro® 500 square above ground	860	680	1250	1.0	3.0	13451
Casing box for DE Ferro® 500 square	1500	1000	1250			82425
DE Ferro® 500 round above ground	700	700	1600	1.0	3.0	13411
DE Ferro® 1000 square above ground	1450	680	1600	1.5	5.0	13456
DE Ferro® 2000 square above ground	1450	1600	1600	3.0	8.0	13456 + 83135
DE Ferro® 1000 square underground	2020	900	1400	1.5	5.0	13450

* Other values /factors increase or decrease the expected amount of regenerated water.

ECO Aqua-Paradies GmbH

Klamannstr. 4 | 13407 Berlin | Germany

phone +49 30 | 436 32 22
fax +49 30 | 436 33 10

aqua@eco-ptn.de
www.eco-aqua.de
www.DEFERRO.de