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DANAMARK watercare
GUIDING WATERCARE INNOVATION

Oxidizing Filters

In some regions water may contain high levels of iron and manganese ions. Although they are not health hazards, both metals are nuisance for household water use. Dissolved iron in particular causes stains on clothing, utensils and kitchenware, and affects the taste and appearance of water and other drinks, forming a black sludge in hot beverages like tea. Iron and manganese ions cannot be removed by laundry detergents, and the problem is even exacerbated by chlorine bleach and alkaline cleaners!

Iron in water causes stains and clogs piping

Iron and manganese share similar chemical properties. When present in water, they exist as dissolved ions, which cannot be captured by a filter. However, when they get oxidized (i.e. react with oxygen), the oxidized form becomes insoluble and deposits in water; hence it can be easily filtered. This chemical property can be utilized to remove iron and manganese ions from water.

Oxidizing filters oxidize iron and manganese ions in the water by utilizing oxygen from air. An aeration system draws air from the atmosphere and vigorously mixes it with the inlet water stream, thereby increasing the level of dissolved oxygen. Oxygen reacts with the ions, thereby rendering them insoluble. A filter bed is used to strain oxidized ions from the water.

Iron oxidizing filter system

As the oxidizing filter operates it becomes saturated with oxidized ions, hence requiring frequent backwashing. Water flows in the reverse direction to wash the filter bed and flush metal ions down the drain.

Some oxidizing filtration systems utilize chlorine, hydrogen peroxide or ozone as the oxidizing agent instead of air. In some systems the filter media is made of Manganese greensand bed that oxidizes iron and manganese ions. These filters require frequent generation by potassium permanganate, yet another oxidizing solution.

Custom oxidizing filter systems are designed depending on water quality and the level of iron and manganese. Preliminary testing is therefore required to optimize the effectiveness of treatment.

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