

## Why not use air based oxidation filtration systems?



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### Introduction

A process called oxidation filtration is a common method used to remove iron, manganese and hydrogen sulfide (egg odor) from the drinking water. This process first introduces an oxidant to convert the un-filterable dissolved contaminants to particles that can be filtered by a granular media. Some of these systems use air to provide oxygen for the oxidant.

The air is introduced in several ways.

- Venturi - a device called a venturi draws unfiltered basement air into the water.
- Air pump - an air pump injects basement air each time the well pump comes on.
- Softener head conversion – a softener head is modified to draw basement air into the filter tank during the regeneration cycle.

Without any assistance, the oxidation process takes about 10 minutes to complete. If a catalytic media is used, the oxidation is almost immediate. Because the reaction is immediate, the oxidation and filtration can take place in the same tank.

These systems often claim to correct pH. To correct pH, hardness is added to the water by dissolving some of the media. This media will need to be replaced regularly.

These systems also claim to be chemical free. Unfortunately, they are not chemical free. They require the addition of oxygen from basement air and they also dissolve chemicals in the water to raise the pH.

### Disadvantages

- All of the systems can inject unfiltered basement air into the water.
- Manganese is not removed in the low pH conditions typically found in our local waters. The pH needs to be above 8 to remove manganese.
- More often than not manganese will bleed into the water causing potential health risks and staining.

- The systems tend to plug pipes and foul media with precipitated iron particles. The need for cleaning the iron results in expensive service calls –see figure 1.



**Figure 1- Fouled by air injection system**

- pH media needs to be added regularly to maintain the system.
- They add hardness to the water and should be followed by a water softener.
- Excess air in the water can cause spitting when water is drawn from faucets.
- They will only remove high concentrations of hydrogen sulfide at low pH.
- Venturi systems only work with oversized well pumps.
- Air pump systems are poorly regulated and can waste energy running unnecessarily.
- Softener head systems do not meet media operating requirements.

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