

Iron & Manganese Removal

When rain falls, the water has a naturally aggressive, slightly acidic nature. This water then dissolves chalk and / or metallic deposits present in the local rock strata, resulting in ground and borehole water containing elements that would not normally be present in mains water. Contaminants such as Iron and Manganese can cause problems such as poor tasting (and potentially harmful) drinking water & staining of appliances and equipment.



An Iron & Manganese filter with a Fleck 2510 valve, Clack valves also available.

Media

Iron and Manganese can be removed from water by using media which encourages reaction between the contaminant and oxygen present in the water. This reaction forms an insoluble precipitate which can then be filtered out by the media bed. The media acts "catalytically", which means that although it triggers the reaction it is not used up as part of the process, thus giving long life from a single filter. A choice of media are available, Pyrolox, Filox & Birm. All are based on Manganese Dioxide but with Pyrolox and Filox having more active sites.

System Management & Backwashing

In order to remove accumulated deposits from the filter bed, the water flow through the filter is reversed (backwashed). Water is run to drain at a high flow rate to separate the deposits from the filter media. The control valve completes the backwash cycle automatically at the intervals and times set during the installation.

The Water Analysis & Filtration System Specification

A water analysis should always be the starting point for the specification of an Iron and Manganese removal system. A filtration system can then be tailor made to suit the individual water chemistry. This often involves the use of one or more of the filters shown on the diagram on the right. These can help the main catalytic filter achieve the desired results.



Contact Assembly

Contact assemblies are designed to aerate water. Air is drawn in using a Mazzei injector which then mixes inside the vessel, This helps by initiating the oxidation of Iron and Manganese. Precipitation starts to occur which can then be removed using a multi media filter, before the water reaches the main catalytic filter.

Multi Media Filter

Physical filters can be used to remove precipitated Iron and Manganese once passed through a contact assembly. A multi media filter consists of a graduated bed of gravel, sand and anthracite. Filtering down to 25 microns, the backwash valve ensures that the sediment is washed away, thus increasing the life of the catalytic media.

pH Correction

Catalytic media work at their optimum efficiency at higher pH levels. A pH system can therefore be used when the water is acidic and / or the water chemistry is considered unfavourable for Iron and Manganese removal. pH correction media is the only media which get "used up" during the process.

Pyrolox Sizing Table

| | | | | | | | | | | | | |
|------------------|--------|--------|--------|--------|----------|----------|--------|--------|--------|--------|------------------|------------------|
| Pyrolox Model | 1044 | 1248 | 1354 | 1465 | 1665 | 1865 | 2160 | 2469 | 3072 | 3672 | 4272 | 4872 |
| Flow Rate m3 | 0.9 | 1.35 | 1.8 | 2.3 | 3.65 | 4.5 | 6.40 | 9.0 | 15.0 | 22.0 | 40.50 | 50.0 |
| B/W Flow Rate | 1.8 | 2.6 | 3.0 | 3.5 | 4.6 | 5.7 | 7.9 | 12.1 | 17.0 | 24.5 | 32.8 | 43.0 |
| Conn. Size Fleck | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1.5" BSP | 1.5" BSP | 2" BSP | 2" BSP | 2" BSP | 2" BSP | Frontal Manifold | Frontal Manifold |
| Conn. Size Clack | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1.5" BSP | 1.5" BSP | 2" BSP | 2" BSP | 2" BSP | 3" BSP | 3" BSP | 3" BSP |

Iron & Manganese Removal



Triplex Filters

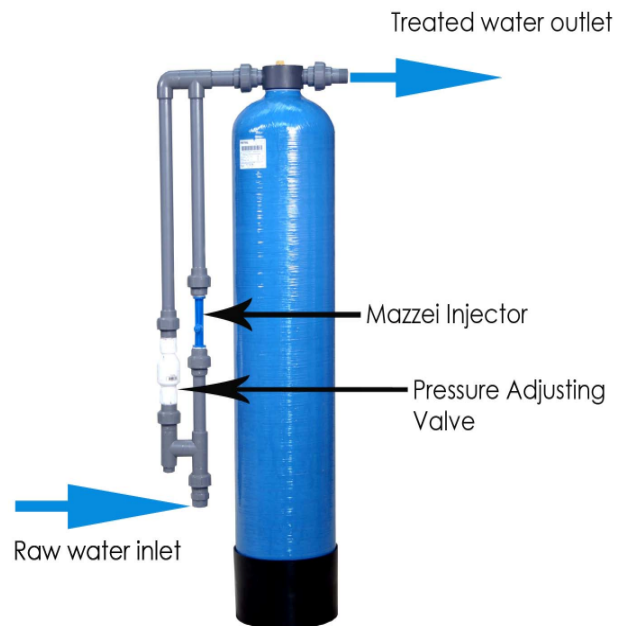
A triplex filter consists of two vessels. The first one is a contact assembly. The second consists of a blend of pH correcting media, and Iron and Manganese removal media and a physical filter media. This works in three ways and has the combined effect of raising the pH of the water, precipitating any dissolved Iron and Manganese and finally filtering out this precipitate. The triplex filtration system is best used on water where the Iron and Manganese levels aren't excessively high and the ratio between Iron and Manganese is at least 5:1.

Contact assemblies are designed to aerate the water and allow a contact time for the air to react with elements of the water. The air is drawn into the vessel by a Mazzei injector. This is designed so that when water passed through the device, a vacuum is created at the tee piece which results in air being sucked into the water flow. A deflector piece in the head then causes the water to swirl as it enters the vessel, thus mixing air with the water. The oxygen in the air can then initiate the oxidation of dissolved Iron and Manganese to produce solid oxides. These are generally used when the ratio between Iron & Manganese is less than 10:1.

On all but the smallest contact assembly, a "bypass leg" is included in the system. This contains a spring loaded valve which opens up at higher flow rates and therefore pressure. The idea of this is to allow water to bypass the small orifice of the injector when a filter ahead of the contact assembly goes into backwash and therefore requires a higher volume of water than in service.

Contact assemblies can also be used to oxidise Hydrogen Sulphide and also Ammonium and Nitrites (into Nitrates)

The Contact Assembly



Birm Sizing Table

| | | | | | | | | | | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|----------|----------|--------|--------|--------|------------------|------------------|------------------|
| Birm Model | 1054 | 1248 | 1354 | 1465 | 1665 | 1865 | 2160 | 2469 | 3072 | 3672 | 4272 | 4872 | 6367 | 6386 |
| Flow Rate m3 | 0.6 | 0.85 | 1.0 | 1.2 | 1.5 | 1.9 | 2.6 | 3.4 | 5.3 | 7.7 | 10.5 | 14.0 | 18.0 | 24.0 |
| B/W Flow Rate | 1.2 | 1.7 | 2.0 | 2.4 | 3.0 | 3.8 | 5.2 | 6.8 | 10.6 | 15.4 | 21.0 | 28.0 | 36.0 | 48.0 |
| Conn. Size Fleck | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1.5" BSP | 1.5" BSP | 2" BSP | 2" BSP | 2" BSP | Frontal Manifold | Frontal Manifold | Frontal Manifold |
| Conn. Size Clack | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1.5" BSP | 1.5" BSP | 2" BSP | 2" BSP | 2" BSP | 3" BSP | 3" BSP | 3" BSP |

| | | | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|
| Triplex Model | 150 | 200 | 250 | 350 | 500 | 600 | 750 |
| Flow Rate m3 | 1.08 | 1.32 | 1.56 | 1.86 | 2.46 | 3.0 | 4.20 |
| B/W Flow Rate | 1.08 | 1.32 | 1.56 | 1.86 | 2.46 | 3.0 | 4.20 |
| Conn. Size Fleck | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP |
| Conn. Size Clack | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP | 1" BSP |

Triplex Sizing Table

For all filters minimum pressure is 2 bar.
Maximum pressure is 8 bar.
Fleck valves are supplied as standard with "no bypass" valves.
Clack valves are supplied as standard with "bypass valves".
Clack valves can be specified with a "no bypass" assembly as an option.
Filter physical dimension sheet available separately