



PACIFIC WATER TECHNOLOGY

CHEMICAL FREE IRON REMOVAL FILTERS



MediaPlus is an efficient and economical catalytic media for the reduction of dissolved iron and manganese compounds from raw water supplies. It may be used in either gravity fed or pressurised water treatment systems. MediaPlus acts as an insoluble catalyst to enhance the reaction between dissolved oxygen (D.O.) and the iron compounds. In ground waters the dissolved iron is usually in the ferrous bicarbonate state due to the excess of free carbon dioxide and is not filterable. MediaPlus, acting as a catalyst between the oxygen and the soluble iron compounds, enhances the oxidation reaction of Fe^{++} to Fe^{+++} and produces ferric hydroxide which precipitates and may be easily filtered. The physical characteristics of MediaPlus provide an excellent filter media which is easily cleaned by backwashing to



remove the precipitant. MediaPlus is not consumed in the iron removal operation and therefore offers a tremendous economic advantage over many other iron removal methods. Other advantages of MediaPlus include; long material life with relatively low attrition loss, a wide temperature performance range and extremely high removal efficiency. Negligible labour costs are involved because MediaPlus does not require chemicals for regeneration, only periodic backwashing is required.

ADVANTAGES

1. Under the proper conditions, no chemicals to purchase for maintenance.
2. Chemical Free= only air required
3. Regeneration not required.
4. Iron removal efficiency is extremely high.
5. Negligible labour cost: only periodic backwashing required.
6. Durable material with a long life and wide temperature range.

Filter Selection

Note: Larger filters and also multiple filter configurations available.
Filter selection is also subject to iron and manganese content in water and also other water parameters including pH and organics. We recommend different treatment for iron bacteria. For hard water containing iron and manganese less than 5 ppm we recommend a water softener to remove all the cations.

Filter Size	Service Flow litres per minute	Backwash Flow litres per minute
12"	13	32
14"	18	44
16"	23	58
18"	42	90
21"	60	120

Options Available

1. Manual or automated backwash valve.



We supply the Clack automated backwash valve, considered the most reliable backwash valve on the market today.



2. Complete System with first stage aeration tank

Includes the following features:

- Flow switch – air injection only when there is water flow.
- Air compressor
- Air release valve.
- Non-Return Valve



TWIN IRON REMOVAL SYSTEM WITH AERATION TANK



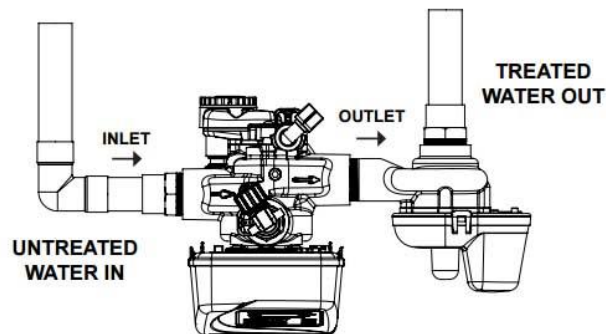
3. Air injection into Clack valve

Air is drawn in during the regeneration cycle via venturi created by the water flowing through the valve. The air injected helps to refresh the catalytic media.

4. No Hard Water Bypass Valve



Prevents any water from bypassing the service outlet during the backwash cycle. Also ensures that there is enough pressure and flow to fully expand and fluidise the media bed during backwash.



About Ozone.

While iron and manganese don't pose health problems, water contaminated by these species can stain water fixtures and clothing that is washed with this water. Oxidation of Fe by aeration is possible unless the Fe is complexed or the reaction has to take place under acidic conditions. In these cases a stronger oxidant such as ozone is required. Manganese, complexed or not, cannot be oxidised by aeration. Pacific Water Technology supplies ozone generators and associated equipment that can be used for iron and manganese removal.

Chlorine can also be used for oxidation of iron and manganese, but significantly more chlorine is required versus ozone. This is due to the fact that ozone has an oxidation potential 150% greater than chlorine. The use of chlorine can also result in the formation of THM if organic material is present in the water.

Application of ozone for iron and manganese removal depends on a variety of factors. The following discussion provides some base line information on the conditions and amounts of ozone required. Pilot testing will define the exact amount of ozone required and the type of ozone generator equipment required.

Ozone oxidises iron from Fe (II) to Fe (III). Fe (III) hydrolyses to Fe (OH)₃ which precipitates to a solid form which can be filtered. The oxidation reaction requires 0.43 mg of ozone per mg of Fe (II). Excess ozone can be used without negative effect. Fe oxidizes in the pH range of 6-9.

Ozone oxidises Mn (II) to MnO₂ (Mn IV) which is insoluble and can be filtered out of the water. The oxidation reaction requires 0.88 mg of ozone per mg of Mn (II). Excess ozone beyond this ratio will form soluble Mn (VII), permanganate. If oxidisable organic material is present in the water and there is sufficient contact time, permanganate will be reduced back to MnO₂ (Mn (IV)). Manganese oxidation is most effective around a pH of 8.

In general, when organic materials are present in water, more ozone will be required than the amount shown above since ozone will also oxidize these materials. The nature of the precipitate will depend on temperature and water chemistry.

It is important to note that at start-up ozone might strip deposits of iron and manganese in the treatment plant. During the break in period, therefore, iron and manganese may remain high until these deposits are removed. Beyond removing iron and manganese ozone offers other benefits including micro flocculation which can result in improved filtration.

Ozone use is not indicated in all situations. If more than 100 micrograms of Br ion are present the formation of bromate might be possible. With water temperature above 40 degree Celsius ozone will decompose prematurely.

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