

# **IRON and MANGANESE REMOVAL GENERAL TURBIDITY FILTRATION**

Both metallic and some non-metallic contaminants can be removed from water by passing the water through a bed of specialised media. These media act in two ways; triggering the precipitation of the contaminant to form an insoluble particle and then physically filtering out the contamination to leave clean water. By selecting the correct media, very specific water problems can be treated easily.

### **Iron and Manganese (plus Aluminium and Hydrogen Sulphide)**

Iron and Manganese can be removed from water by using a media which encourages reaction between the contaminant and oxygen present in water. This reaction forms an insoluble precipitate which can then be physically 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 depending upon the exact chemical make-up of the water to be filtered. Each have their strengths and weaknesses and your local water treatment expert will be able to advise as to the best choice.

The media most commonly used are:-

**BIRM**, which gives good removal at a relatively low cost. Generally suited to waters that would be considered hard in nature, its performance is adversely affected by the presence of chlorine, organic contaminants and some chemical treatments.

**FILOX R**, has a much higher level of activity than BIRM, and is more suitable across a greater range of waters. It is chlorine resistant and can be used to help in the removal of hydrogen sulphide (the bad egg smell that is sometimes encountered).

**MANGANESE GREENSAND**, generally only used in industry for iron and manganese removal, as it requires chemical regeneration (with Potassium Permanganate) to restore its activity.

### **Turbidity Removal**

General turbidity removal at high flows can be



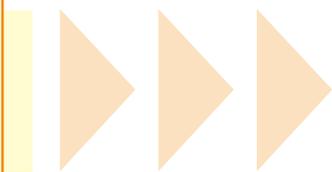
*Fleck 2510 & 2750 Valves illustrated*

achieved satisfactorily down to low micron levels using a multi media filter with a layered bed of gravel, filter sand, garnet and anthracite or Filter AG media. Other specialist media may need to be added to the filter bed to improve polishing with certain types of water.

### **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 installation. The backwash and rinse cycle takes approximately 20 minutes, although these can be altered to suit individual conditions.

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## Specifying and Sizing

BIRM Operating parameters:

Oxygen level = 15% of iron level. pH range = 6.8 - 9.0. Alkalinity greater than 2 x (Sulphate + Chloride), no Hydrogen Sulphide, oil or polyphosphates. Organic matter less than 5ppm. Free chlorine less than 0.5ppm. Temperature 3-45°C (35-110°F).

BIRM, Greensand and Multi-Media Filter Systems include service and drain line flow controllers. NB Backwash flow per vessel is twice the service flow, therefore where possible use two or more small units instead of one large one.

## Technical Details and Model Numbers for BIRM systems and Multi Media Filters.

<b>BIRM Model</b>	FB1054	FB1248	FB1354	FB1465	FB1665	FB1865	FB2160	FB2469	FB3072	FB3672	FB4278
<b>Multi Media Model</b>	FM1054	FM1248	FM1354	FM1465	FM1665	FM1865	FM2160	FM2469	FM3072	FM3672	FM4278
<b>Flow rate m3/h</b>	0.60	0.85	1.00	1.20	1.50	1.90	2.60	3.40	5.30	7.70	10.50
<b>B/W flow m3/h</b>	1.20	1.70	2.00	2.40	3.00	3.80	5.20	6.80	10.60	15.40	21.00
<b>Connections In/Out</b>	1" BSP	1.5" BSP	2" BSP	2" BSP	2" BSP	2" BSP					
<b>Height mm</b>	1607	1458	1601	1880	1885	1997	1840	2130	2290	2360	2338
<b>Diameter mm</b>	270	315	335	370	410	510	560	620	770	930	1080

## FILOX-R filter systems for removal of Iron, Manganese & Hydrogen Sulphide

Includes service and drain line flow controllers. NB Backwash flow on all systems is greater than service flow. Operating parameters pH range 6-9\* (see FILOX-R data sheet for limita-

tions and pre-tests). Organic Iron below .5ppm, Iron below 27 ppm, Manganese below 11 ppm, Hydrogen Sulphide below 17 ppm, Temperature 3-45°C (35-110°F).

<b>FILOX-R Model</b>	FF835	FF1044	FF1248	FF1354	FF1465	FF1665	FF1865	FF2160	FF2469	FF3072	FF3672
<b>Flow rate m3/h</b>	0.45	0.90	1.35	1.80	2.30	3.65	4.50	6.40	9.00	15.00	22.00
<b>B/W flow m3/h</b>	1.15	1.80	2.60	3.00	3.50	4.60	5.70	7.90	12.10	17.00	24.50
<b>Connections In/Out</b>	1" BSP	1.5" BSP	1.5" BSP	2" BSP	2" BSP	2" BSP	2" BSP				
<b>Height mm</b>	1124	1344	1458	1601	1870	1875	1997	1880	2130	2290	2360
<b>Diameter mm</b>	220	270	315	335	370	410	510	560	620	770	930

NB. To prevent damage to the vessel these filters must be protected from negative pressure from the drain or supply. A vacuum relief valve is recommended on the inlet supply and is supplied with all vessels from 770mm diameter upwards.

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